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The PHOTOFACT Servicer

November 15, 1950 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ Vol. 12, Nos. 113 & 114

"The knocker should always be outside the door." - - Anon.

COLOR TELEVISION - ROUGH ROAD AHEAD

PHOTOFACT Folder Set No. 110 featured the "Business Week" summary of the FCC color TV decision. This article was one of the first considered editorial treatments on the subject. To keep abreast of developments, here is a report of several comments and actions within the industry occurring since then - and up to the press time of this folder.

On Sunday, October 15, Mr. Frank Stanton, President of the Columbia Broadcasting System, made an address on the CBS network treating the subject of color TV. While understandably lauding the CBS color TV process, he not so delicately indicated that television set purchasers might well pause before buying, to await the production of sets equipped to receive CBS color telecasts in about six months or so.

If any signal was necessary to start the public color TV battle, this action apparently provided it. Up to this point, the rather acrimonious debates on technical worth, commercial aspects, and appeal of the competing color TV systems had been largely limited to conference rooms of the FCC, with occasional side trips to the halls of Congress. Here, however, was an approach to the buying public, the bread basket of the fledgling industry, so to speak. With those old "debbils," sales and profits, at stake, it could be expected that those of the industry not in complete agreement with the FCC decision, and, more particularly, Mr. Stanton's recommendations, would be quick to react . . . also publicly.

As expected, sources representing very major producers and interests of the TV industry started swinging with enthusiasm.

Mr. James H. Carmine, Executive Vice President of the Philco Corporation, sent a telegram to Philco distributors outlining the company's color TV stand. Its frank and specific statement briefly covered these points:

1. Color signals on the air will be of limited nature, occurring during fringe hours and not intended for established black and white program service, which Philco believes will continue as the basic TV system for years to come.

2. Philco believes the presently authorized system, with its physical difficulties and limitations, to be unacceptable to the public, and that color TV systems capable of larger pictures and finer performance are now being perfected in the laboratories. However, these are estimated as at least two years away.

3. That TV set customers may purchase present receivers with the knowledge that they can be converted, at nominal cost, to receive the presently authorized color transmission if the owner so desires.

The Pilot Radio Corporation filed an injunction suit against the FCC decision in Federal District Court at Brooklyn. Shortly afterward, the Radio Corporation of America announced the filing of a similar injunction suit against the FCC decision in Chicago Federal Court. Details of the suits are not available yet, but the mere filing of them indicates that positive opposition is not lacking. There are also rumors to the effect that further legal attention with respect to the FCC color TV decision, as well as to alleged regulatory practices of the Commission beyond its specific authorization, will be forthcoming from members of the industry.

The Radio-Television Manufacturers Association (RTMA) Television Committee met privately and discussed the color issue. Subsequently, Mr. Robert C. Sprague, President of RTMA, requested CBS network time of Mr. Stanton to answer charges against the industry made during the October 15 address.

In his address on October 22, Mr. Sprague indicated his faith in present-production black and white receivers to furnish entertainment, representing major emphasis of the industry, for many years to come. He also pointed out the probable limitation of color telecasts to off

hours, with the result that only a small percentage of TV set owners would wish to convert for reception of these programs. On this basis, few advertisers would ignore the tremendous black and white audience, and foot a larger cost for the relatively minor color audience.

Finally, just as this goes to press, we have had the opportunity of viewing a full-page advertisement of Raytheon Television appearing in two local newspapers, and we assume in other areas having television service as well, which provides a very painstaking appraisal of the color TV controversy or situation, as you prefer.

All of which goes to show that the state of confusion over color TV, existent for some time within the industry, itself, has now been promoted to a general public confusion potentially much more dangerous to all segments of the trade.

We know that service technicians will be repeatedly asked for advice by well-meaning, non-technical customers on this development within the television field. In the absence of any really final information on the subject, it would be safer to switch to the weather.

* * *

WHEW! - The First 8 Months - WHEW!

Production figures released by RTMA indicate 1950 production through September 8th of 4,434,810 TV's and 9,350,734 radios of all kinds. TV's are valued at 700 million dollars at factory, and radios at 210 million dollars, a total which exceeds the entire total of 1949.

Here are the figures for the first 8 months:

Television	4,146,602
Home Radios	4,850,402
Automobile Radios	2,782,985
Portable Radios	1,284,578

These figures should give you a good idea of this year's contribution to your potential servicing market, and remember - the figures are thru August, 1950 only.

* * *

SIMMONS ELECTRIC BLANKET CONTROLS (Green Label & Yellow Label Type) (Styles AC1 & AC2) SERVICE DATA FREE FOR THE ASKING

We recently prepared a service manual for the Simmons Company covering their electronically controlled blanket. You can get a copy free by writing for one to -

George F. Brasfield & Co., Inc.,
Blanket Division,
1221 Commerce Street,
Petersburg, Virginia

Ask for Form BD-58.

* * *

VOICE OF DEMOCRACY CONTEST

Material for the promotion of this year's Voice of Democracy Contest was mailed to 1700 radio stations, 2800 U. S. Junior Chamber of Commerce local chapters and to 28,000 high school principals throughout the country.

A brochure, "How to Speak for Democracy," containing pertinent information, dates and instructions designed to promote the Voice of Democracy Contest and to assist contestants may be had upon application to the U. S. Office of Education, Washington, D. C. This activity helps to keep the servicing business good. Support it by encouraging youngsters you know to participate in it.

* * *

CHARACTERISTICS OF TELEVISION PICTURE AND GENERAL PURPOSE CATHODE-RAY TUBES

A new 12-page booklet, in which characteristics of 194 cathode-ray tubes for television receivers, oscilloscope and radar applications are tabulated, has just been published by Sylvania.

One hundred and three magnetic and 91 electrostatic types with screen sizes from two to twenty-two inches are described. Data includes: heater current and voltage; nominal dimensions; basing; persistence and flourescence of screen; maximum design center ratings; typical operating conditions.

The booklet includes table of phosphor characteristics, fifty basing diagrams and useful suggestions for the physical handling and high voltage circuit adjustment practice.

SYLVANIA SUBMINIATURE TUBE DATA

A data chart published by Sylvania provides average characteristics of thirty commercially available subminiature electron tubes, with suggestions for mounting, shielding and application. The booklet and chart may be obtained free from the advertising department, Sylvania Products Inc., Emporium, Pennsylvania.

BOOK REVIEWS -

MAGNETIC RECORDING

By S. J. Begun
Vice President and Chief Engineer
The Brush Development Company

232 pages, 6 x 9, hand bound. Publisher: Murray-Hill Books, Inc., New York 16, New York. Price $5.00.

This book brings together information on magnetic recording in its design, engineering, application, and experimental phases.

Acoustic and magnetic factors, including the complexities of ferromagnetic materials are explained. AC and DC biasing methods, distortion factors, reproducing heads, drive mechanisms, and various recording media as well as methods of recording, reproduction, and erasing are discussed.

RADIO ENGINEERING HANDBOOK
4th Edition
Edited by Keith Henney

1198 pages, 6 x 9, hand bound. Publisher: McGraw-Hill Book Co., Inc., New York 10, New York. Price $10.00.

Radio engineering problems are solved more quickly with the aid of this revised edition. Here are principles, standards, and procedures that mean quick answers to routine and special assignments in communications, broadcasting, aircraft radio, television, and related fields.

The book contains 1197 pages of design data - charts, tables, circuits, diagrams, and formulas.

A new section discusses the physical, mathematical, and acoustical bases on which all electrical communication exists; another points up the means of transmitting and utilizing energy in the very high frequency portions of the radio spectrum. New subjects covered include: cavity magnetrons, radar, and loran, sequential scanning, crystal converters, TV allocation, disk seal tubes, lobe switching, and scores of others.

(This book is a MUST for a good technical library. - Howard W. Sams)

* * *

WE'LL PAY $5.00 FOR YOUR IDEAS
ON NEW WAYS TO USE
PHOTOFACT FOLDERS

Have you found some novel way of putting your PHOTOFACT Folders to work so you get extra value and help from them? Tell us about it, and if the idea is good enough to pass on to thousands of your fellow PHOTOFACT subscribers, we'll print it in the "Servicer" and send you a crisp $5.00 check. Here's one practical suggestion we've received that was well worth $5.00.

> "It is at times necessary to bring a radio back to the shop for proper servicing, and we have found that some persons object to this. When we go on one of these calls we take a copy of the PHOTOFACT Folder on the set in question with us, and by showing them that the PHOTOFACT mentions the importance of having the set and cabinet together they always agree to it."
>
> Donat A. Duquet Repair Shop
> 10 Monument Street
> Winslow, Maine

* * *

FIELD EXPERIENCES -

For every "Field Experience" published, we issue a certificate good for one PHOTOFACT Folder Set. Awards are issued at the time of publication. Since it is impossible to verify the accuracy of contributions, we cannot be responsible for either the diagnosis made of the receiver trouble, or the results which will be obtained by following the suggested repair routine. All contributions become the property of Howard W. Sams & Co., Inc.

TRAV-LER Model 16-T
Photofact Set No. 86, Folder No. 11

Complaint: Unable to lock picture horizontally.

Cause: C-47 video coupling capacitor shorted.

Remedy: Replace C-47 with good .01 MFD. 600 volt capacitor. This capacitor connects to pin No. 7 of 12AU7 - V11.

P. E. McGee
Moreland Ave. Radio & Tel. Service
926 Moreland Avenue, S. E.,
Atlanta, Georgia

* * *

GENERAL ELECTRIC Model 12T7
Photofact Set No. 99A, Folder No. 5

Complaint: Picture off or dim. No sound.

Sometimes there would be odor of burning. Trouble was intermittent.

Cause: In three of this type set and in one of the newer 16" sets I found that a short had developed inside of the first IF can (T 401) and that this caused resistors R 403 - 10,000 ohms, and R 313 - 1,000 ohms, to heat and burn and in two of these sets the short disappeared when I put the set on its side to examine it.

Remedy: Changing the cans cured the trouble in all cases.

DUMONT Model RA 101-B

Complaint: Picture narrowed in from the sides with a definite fold-over of about an inch on both sides. Sides showed a ragged and torn outline that would suggest a bad sweep output in transformer and the picture was divided and transposed, the right half being on the left side and the left half on the right side.

Cause: After much fooling around with tubes and components on the sweep chassis the trouble was finally located in a small four tube chassis called the sync stabilizer chassis. It was an open 10 watt 5000 ohm resistor between pin 8 of the cable connector socket and the 6K6 tube. The resistor showed no sign of damage.

Remedy: Replace resistor.

Editor's Note: Both above Field Experiences were contributed by:

Irving B. DuBarry, Sr.
Aerio Marine Radio & TV Service Co.
1035 S. W. 27th Avenue
Miami 35, Florida

* * *

TRAV-LER Model 16T50
Photofact Set No. 99A, Folder No. 13

Complaint: Picture can't be held vertically.

Cause: All tubes and suspected parts check okay. However, the green lead from vertical output transformer has moved near the filament leads of the 6W4 tube.

Remedy: Correct dress of this lead will cure trouble.

DeClue Radio & T. V. Service
Dale Street
Herculaneum, Missouri

* * *

PHILCO Model 46-350
Photofact Set No. 10, Folder No. 24

Complaint: This was one of the early models that used a 3Q5GT/G for the output tube. I found that the heat given off by the 117Z3 causes the 3Q5 to blow out after about 4 or 5 months.

Remedy: I replaced the 117Z3 with a selenium rectifier. The 75MA type with the positive terminal going to the cathode and the negative terminal to which there is connected a 27 ohm limiting resistor, is connected to the plate pin. I soldered a long thin screw to the case of the volume control and mounted the rectifier on this screw and used No. 18 wire to connect the cathode. of the tube socket to the positive terminal of the rectifier and the limiting resistor is a one watt size and the wire from the resistor will make the negative lead. The No. 18 wire fits snugly into the pin terminals of the tube socket. When this is completed the radio will play instantly just as if it were playing on the battery.

Robert W. Sloat
505 Columbus Avenue
New York 24, N. Y.

* * *

PHILCO Model 49-905
Photofact Set No. 52, Folder No. 16

Service Hint: Before replacing a burned out dial lamp or 35W4 tube, remove the tube from its socket and check the resistance between the 35W4 socket terminals No. 5 and No. 7 (plate and cathode). If the resistance is less than infinity, the 100 MMF capacitor, Item No. 31, between plate and cathode, is shorting and will burn out the tube and lamp replacements. The other 100 MMF capacitor, Item No. 30, between plate and B- should also be replaced.

C. W. Battels
Battels Radio-Electronics Service
559 Wooster Avenue
Akron 7, Ohio

SUPPLEMENTAL DATA TO FOLDER 2 SET #103

ADMIRAL CHASSIS 24D1, 24E1, 24F1, 24G1, 24H1

PICTURE "WIGGLE" IN 24D1 SERIES CHASSIS.

In areas where the transmitter power line frequency is not in sync with the receivers power line frequency, the magnetic field around the receivers power transformer will cause a continual "wiggle" or ripple in the picture. The condition will not normally occur where the transmitter and receiver AC lines are synchronized to the same frequency. Before deciding that the ripple or "wiggle" is a result of the picture tube being in the field of the power transformer make certain that none of the filter components in the B+ supply to the sweep circuits are at fault, since excessive AC ripple in the B+ line may cause picture wiggle.

The condition can be corrected by the use of a copper-banded power transformer which is mounted below the chassis. The new transformer part # 80B24-1 is mounted as follows:

Remove and reverse mounting bolts.
Solder 2" extensions to all but brown and blue leads.
Unsolder old transformer leads.
Mount new transformer under chassis.
Cut a hole in the chassis mounting board as the new transformer will protrude below the chassis.

Chassis 24D1, E1, F1, G1, H1

ARCING FROM 6S4 TUBE SOCKET

A new socket for the 6S4 vertical output tube is used to prevent arcing between pin 9 and ground. The new socket part #87A25-3 is used in late productions and should be used whenever replacement is necessary.

When arcing occurs, the increased current may damage R78. Although the resistor may show normal value when checked with an ohmmeter it should be replaced when the socket is changed.

SUPPLEMENTAL DATA TO FOLDER 4 SET #93

DUMONT MODELS RA-103D, RA-104A, RA-110A

**RA-103D Serial #0321680 & up
RA-104A Serial #044201 & up
RA-110A Serial #017128 & up**

The color designation of certain video IF coils have been changed as follows:
L20 changed to green color part #21004135
L24 changed to green color part #21004135
L27 changed to blue color part #21004136
These changes were made to provide coils that will operate more nearly on design center.

The wattage rating of R76 was increased to 1 watt to prevent failure of this part due to overheating.

**RA-103D Serial #0340724 & up
RA-104A Serial #0413334 & up
RA-110A Serial #102236 & up**

ELIMINATION OF HORIZONTAL JITTER

Horizontal jitter has been noticed when receiving a weak TV station. This has been caused by feedback of the pulses of the horizontal output system into the horizontal sync circuits and video amplifier.

The following changes were made in production and may also be performed in the field.

1. In the early models, the plate circuit of the video amplifier (V8) was connected to the junction of R129B and the focus control R4. With this wiring arrangement the only time the B+ line going to the video amplifier was completely bypassed by C3B, was when the focus control was at its extreme clockwise position.

In order that this line be adequately bypassed at all times, the B+ line to the video amplifier is now connected to the arm of the focus control. This change reduces the B+ to the video amplifier about 25 to 30 volts but does not noticeably affect the operation of the stage.

2. In addition to the above wiring change, it was necessary to redress certain leads to eliminate pick-up in the sync circuits. The proper lead dress is described below:

(a) The lead from the coupling capacitor (C78) to the grid of the sync clipper (V15A) should not be run under the main cable between the two large filter capacitors (C1 and C2). The lead should go straight from the terminal board toward the rear of the chassis, and then after a 90° turn it goes to the grid of V15A so that it passes under the main cable at right angles.

(b) The lead from the high side of the yoke now goes to pin 6 of the 5V4 by running parallel with the main cable through the space between the two large filter capacitors (C1 and C2) and then to the 5V4. This yellow lead should go toward the linearity coil after emerging from the grommet and then after a 90° turn to pin 6 of the 5V4.

**RA-103D Serial #0336701 & up
RA-104A Serial #0411701 & up
RA-110A Serial #101712 & up**

ELIMINATION OF HIGH VOLTAGE ARCING IN VERTICAL OUTPUT TUBE

The values of the following components were changed to eliminate arcing in the vertical output tube, since such arcing disturbs the raster vertically.

C86 changed to .02MFD ⓐ 400 volts.
R97 changed to 330KΩ ⓐ ½ watt.
R98 changed to 2Meg. ⓐ ½ watt.
R103 changed to 1Meg. ⓐ ½ watt.
R100 changed to 680Ω ⓐ ½ watt.

The values of the resistors across each half of the vertical coils in the deflection yoke are 560Ω ⓐ ½ watt each.

SUPPLEMENTAL DATA TO FOLDER 6 SET #87

EMERSON MODELS 600, 639 (Ch. 120103-B)

The following changes should be incorporated in those chassis which do not have the modifications.
Isolate the junction of R74 and R75 to minimize leakage by cutting the terminal strip.
R28 changed from 22KΩ to 10KΩ
R71 changed from 22Meg. to 18Meg.
R91 changed from 4.7Meg. to 5.6Meg.
R94 changed from 4.7Meg. to 5.6Meg.
R105 changed from 75Ω to 100Ω
R106 changed from 2.5Ω ⓐ 1/2W. to 2.5Ω ⓐ 2W.

HOWARD W. SAMS & CO., INC. • Indianapolis 1, Indiana

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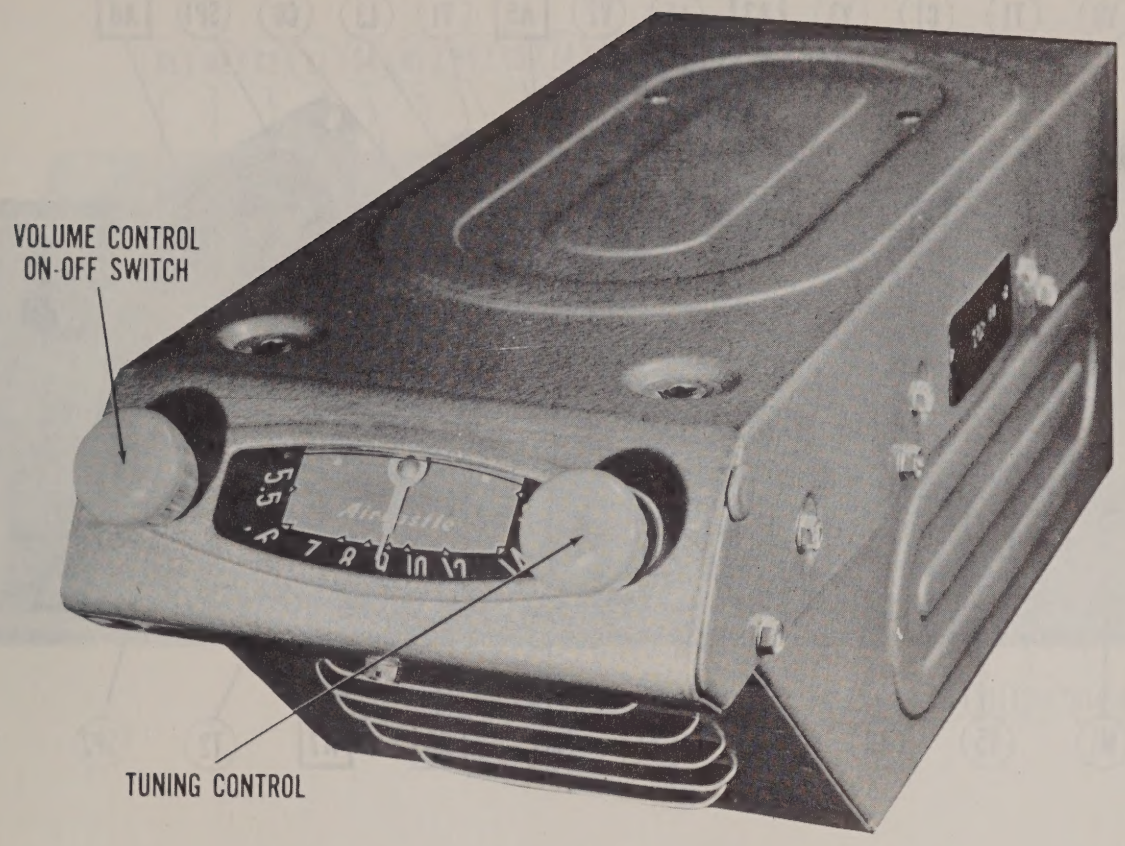
AIRCASTLE
MODEL 602-182144



AIRCASTLE
MODEL 602-182144

AIRCASTLE MODEL 602-182144

TRADE NAME	Aircastle, Model 602-182144
SUPPLIER	Spiegel Inc., 1061 W. 35th St., Chicago, Illinois
TYPE SET	Battery Operated Universal Automotive Receiver
TUBES (SIX)	Types 6SK7 RF Amp., 6SA7 Converter, 6SK7 IF Amp., 6SQ7 DET-AVC-AF, 6V6GT Power Output, 6X5GT Rectifier
POWER SUPPLY	6 Volt Storage Battery — RATING 5.6 Amp. at 6 Volts DC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning gang fully closed and set pointer to white dot on red background at low frequency end of dial.

The value of the capacitor used as dummy antenna is of a critical value. Any value used other than stated may result in a serious misalignment.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 8 (Grid) of 6SA7 (V2). Low side to chassis.	455KC (400 ∿ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	75MMF	High side to antenna lead. Low side to chassis.	"	"	"	A5	Adjust for MINIMUM output.
3.	75MMF	"	1600KC	"	"	A6	Adjust for maximum output.
4.	75MMF	"	1400KC	Tune for max. output	"	A7, A8	"
5.	After receiver is installed in auto, tune in a weak station at approximately 1100KC and adjust A8 for maximum volume.						

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PARTS LIST AND DESCRIPTIONS

AIRCASTLE
MODEL 602-182144

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AIRCASTLE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	RF Amp.	6SK7	6SK7	8N	
V2	Converter	6SA7	6SA7	8R	
V3	IF Amp.	6SK7	6SK7	8N	
V4	DET.-AVC-AF	6SQ7	6SQ7	8Q	
V5	Power Output	6V6GT	6V6GT	7AC	
V6	Rectifier	6X5GT	6X5GT	6S	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIRCASTLE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	30	350	A18-289	AF64H4A		UP2235C		TVL-3636	■ Filter
B	20	350							▲ Filter
C	20	25							Output Cath. Byp.
C2	.01	400	A16-192	P488-01	D6-103	PTE4S1	811-01	4TM-S1	RF Coupling
C3	.05	400	A16-189	P488-05	DF-503	PTE4S5		4TM-S5	AVC Filter
C4	.01	400	A16-192	P488-01	D6-103	PTE4S1	811-01	4TM-S1	RF Cath. Bypass
C5	100		A15-196	SI100	D6-101	5W5T1	GP1K-100	19C11	RF Coupling
C6	20		A15-202	SI20	TCN-20	5R5Q2	N750K-20	19C7	Fixed Trimmer
C7	50		A15-204	SI50	D6-500	5W5Q5	GP1K-50	19C28	Osc. Grid Cap.
C8	12		A15-205				N150K-12		Fixed Trimmer
C9	.1	400	A16-187	P488-1	DF-104	PTE4P1		4TM-P1	Decoupling
C10	250	500	A15-176	1468-00025	D6-251	5W5T25	GP2K-250	1FM-325	Diode RF Filter
C11	.005	600	A16-190	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Audio Coupling
C12	1000		A16-195	SI1000	D6-102	1W5D1	GP2L-001	19C1	AF Amp. Plate Byp.
C13	.05	600	A16-193	P688-05	DF-503	PTE6S5		6TM-S5	Audio Coupling
C14	.01	400	A16-192	P488-01	D6-103	PTE4S1	811-01	4TM-S1	Output Plate Bypass
C15	.005	1600	A16-185	P1688-005		PTE16D5		MB-D5	Buffer
C16	.5	100	A16-184	P185-5				68P20	Hash Filter
C17	.5	100	A16-184	P185-5				68P20	Hash Filter

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRCASTLE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	500KΩ	½	A24-182	Q13-133	AG-60-Z	BSK-60-S	Volume control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R1A per instructions

RESISTORS

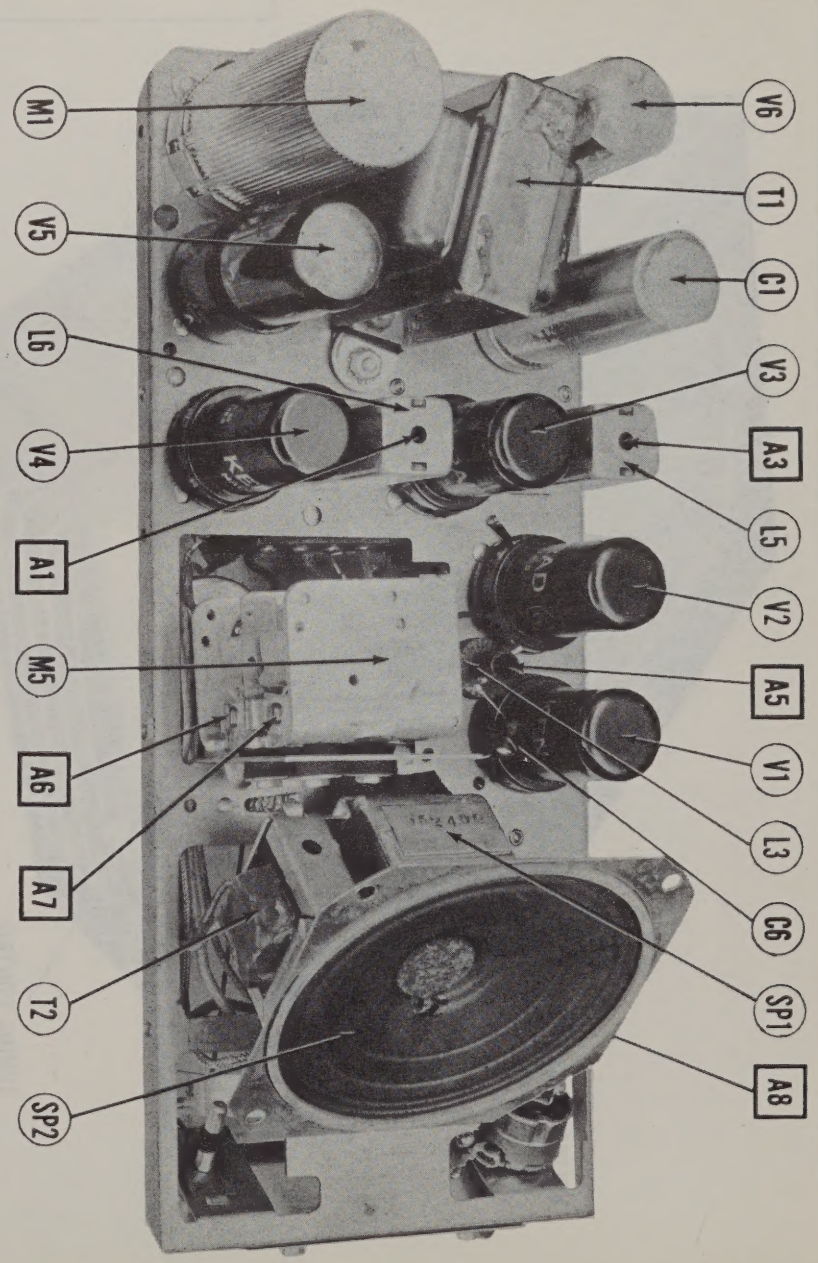
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRCASTLE PART No.	IRC PART No.	IDENTIFICATION CODES
R2	270Ω	½	A60-771	BTS-270	RF Cathode
R3	22KΩ	1	A60-659	BTA-22K	RF Plate
R4	47KΩ	½	A60-685	BTS-47K	Conv. Screen
R5	22KΩ	1	A60-659	BTA-22K	Osc. Grid
R6	150Ω	½	A60-767	BTS-150	IF Cathode
R7	7500Ω	2	A60-769		Decoupling
R8	2.2 Meg.	1	A60-726	BTA-2.2 Meg.	AVC Network
R9	10 Meg.	1	A60-728	BTA-10 Meg.	AF Grid
R10	220KΩ	½	A60-667	BTS-220K	AF Plate
R11	470KΩ	½	A60-731	BTS-470K	Output Grid
R12	270Ω	½	A60-771	BTS-270	Output Cathode
R13	470Ω	1	A60-770	BTA-470	Filter
R14	100Ω	½	A60-725	BTS-100	Hash Supp.
R15	100Ω	½	A60-725	BTS-100	Hash Supp.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: AIRCASTLE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	6VDC @ 5.6A	470VCT .045ADC			B80-243	P-6301 ①	P-2970	VT-7①

① Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		AIRCASTLE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	6700Ω	4.5Ω	365Ω	.4Ω	B80-242	A-3878 ②	A-2931 ②	RO-13 ②	② Bend mounting tabs down and mount on original bracket.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			AIRCASTLE PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	V. C. IMP.		ST-113		
SP1	PM	4.5Ω	B79-360	Mod. P4-X	4A07	
	CONE DIA.	V. C. DIA.				
SP2	4"	9/16"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	AIRCASTLE PART No.	MEISSNER PART No.	
L1	Ant. Loading	.7Ω		A10-527		
L2	Ant. Coil	4.2Ω		B10-511		Tap at 2.7Ω
L3	IF Trap	48Ω		A10-510		
L4	Osc. Coil	6.2Ω		A10-512	14-1073	Tap at 1.2Ω
L5	1st IF	20Ω	20Ω	A10-508	16-6758	
L6	2nd IF	19Ω	19Ω	A10-509	16-6758	
L7	Hash Choke	0Ω		A33-229		
L8	Hash Choke	.2Ω		A33-228		

DIAL LIGHTS

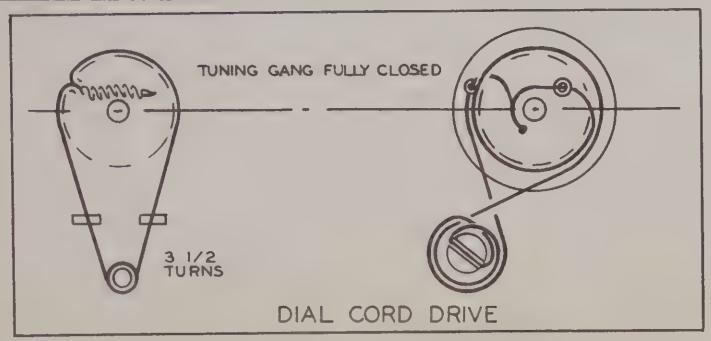
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					AIRCASTLE PART No.		
M2	Bayonet				A-89-10		Type #422

VIBRATOR

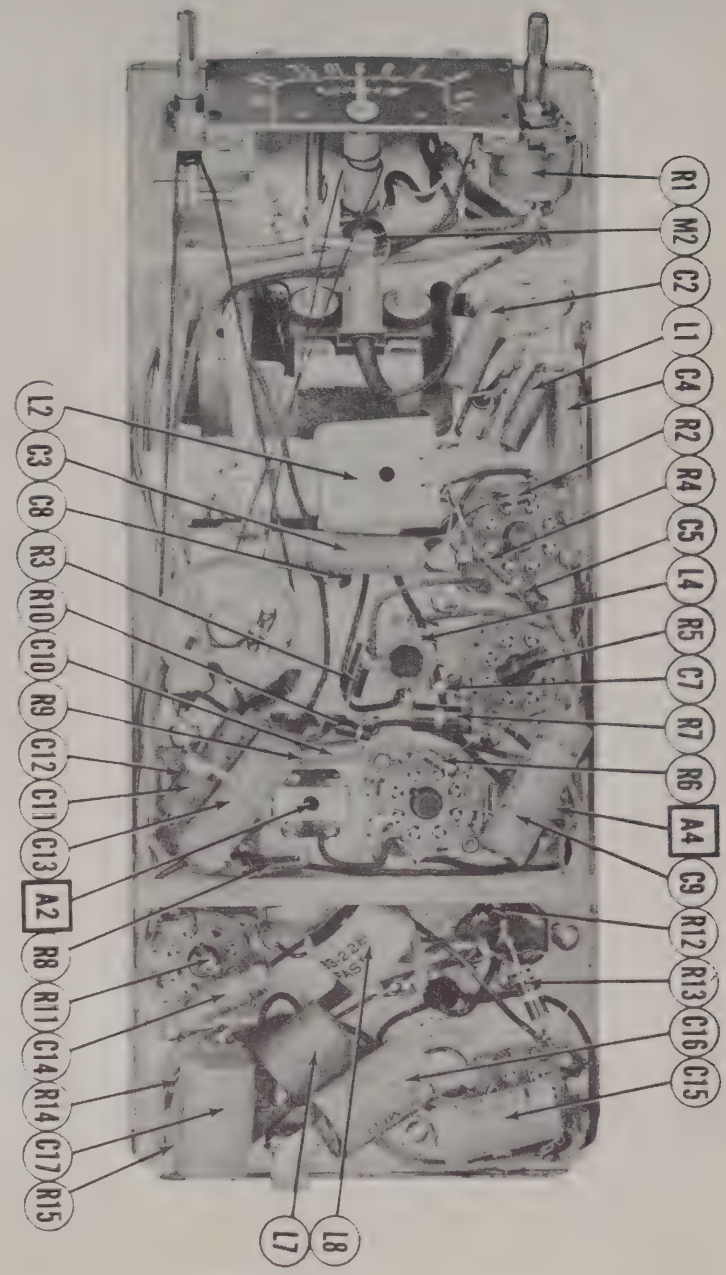
ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				INSTALLATION NOTES
				AIRCASTLE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	RADIART PART No.	
M1	Int.	6VDC	115 ∿	A34-105	A-100	5301	5301	

MISCELLANEOUS

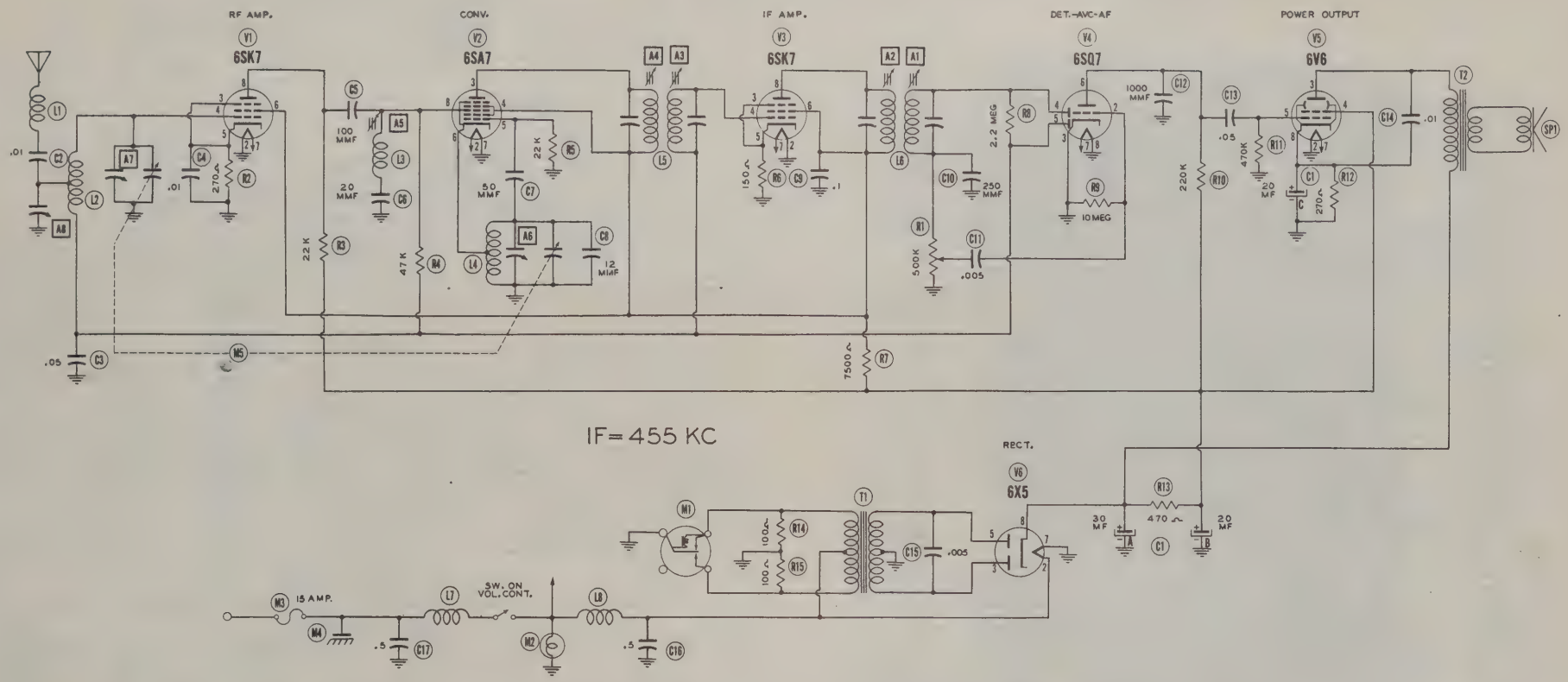
ITEM No.	PART NAME	AIRCASTLE PART No.	NOTES
M3	Fuse	A43-10	15 Amp.
M4	Spark Plate		
M5	2 Gang Var. Cap.	B19-201	(16-472MMF, 17-195MMF)
A8	Trimmer	A20-145	Ant. Adj.
	Dial Scale	B67-551	
	Dial Pointer	A58-55	
	Knob	A52-314	



CHASSIS—BOTTOM VIEW



AIRCASTLE MODEL 602-182144



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SK7	0V.	0V.	1.6VDC	-.8VDC	1.6VDC	70VDC	6VDC	80VDC
V 2	6SA7	0V.	6VDC	70VDC	70VDC	§-9.4VDC	0V.	0V.	-.5VDC
V 3	6SK7	0V.	0V.	1.2VDC	-.8VDC	1.2VDC	70VDC	6VDC	70VDC
V 4	6SQ7	0V.	-.7VDC	0V.	-.5VDC	-.6VDC	90VDC	6VDC	0V.
V 5	6V6GT	0V.	0V.	170VDC	170VDC	0V.	0V.	6VDC	8.4VDC
V 6	6X5GT	0V.	6VDC	200VAC	0V.	200VAC	0V.	0V.	180VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SK7	0Ω	0Ω	270Ω	2.7 Meg.	270Ω	†8KΩ	.4Ω	†22KΩ
V 2	6SA7	0Ω	.4Ω	†8KΩ	†8KΩ	22KΩ	1.2Ω	0Ω	2.7 Meg.
V 3	6SK7	0Ω	0Ω	150Ω	2.7 Meg.	150Ω	†8KΩ	.4Ω	†8KΩ
V 4	6SQ7	0Ω	10 Meg.	0Ω	500KΩ	2.7 Meg.	†220KΩ	.4Ω	0Ω
V 5	6V6GT	0Ω	0Ω	†365Ω	†470Ω	470KΩ	Inf.	.4Ω	270Ω
V 6	6X5GT	0Ω	.4Ω	500Ω	0Ω	500Ω	0Ω	0Ω	140KΩ

† MEASURED FROM PIN 8 OF V6.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

CROSLEY MODELS
10-404MU, 10-404M1U, 10-412MU,
10-418MU, 10-420MU

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MODEL 10-420MU

CROSLEY MODELS
10-404MU, 10-404M1U, 10-412MU,
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CROSLEY MODELS 10-404MU, M1U, 10-412MU, 10-418MU, 10-420MU

CROSLEY MODEL 10-420MU

TRADE NAME	Crosley, Models 10-404MU, 10-404M1U, 10-412MU, 10-418MU, 10-420MU
MANUFACTURER	Crosley Corp., 1329 Arlington St., Cincinnati, Ohio
TYPE SET	Television Receiver
TUBES	Twenty One
POWER SUPPLY	110-120 Volts AC — RATING 1.4 Amp. at 117 Volts AC
TUNING RANGE	44-216MC (Continuous Tuning)

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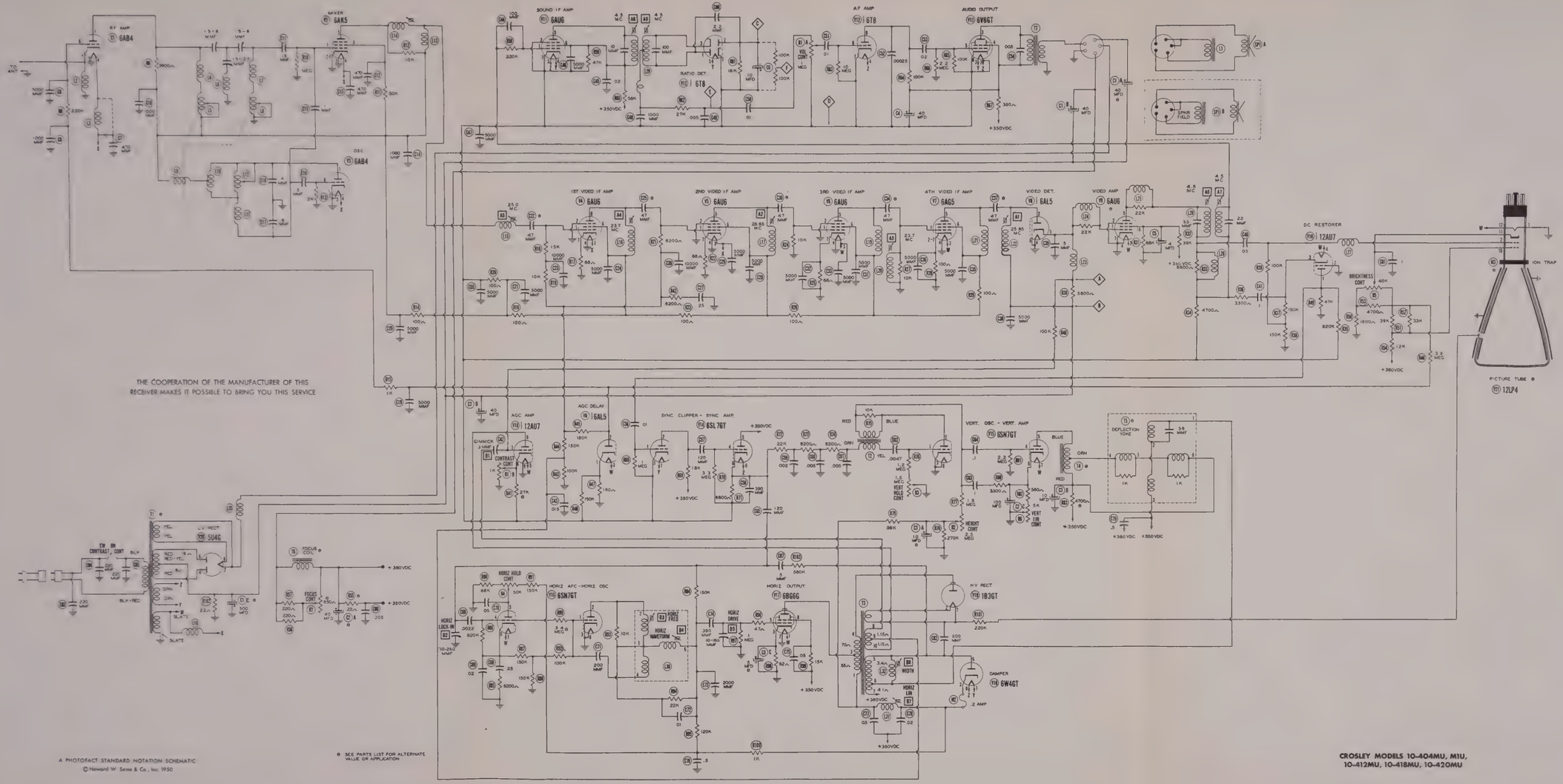
CROSLEY MODELS 10-404MU, M1U, 10-412MU, 10-418MU, 10-420MU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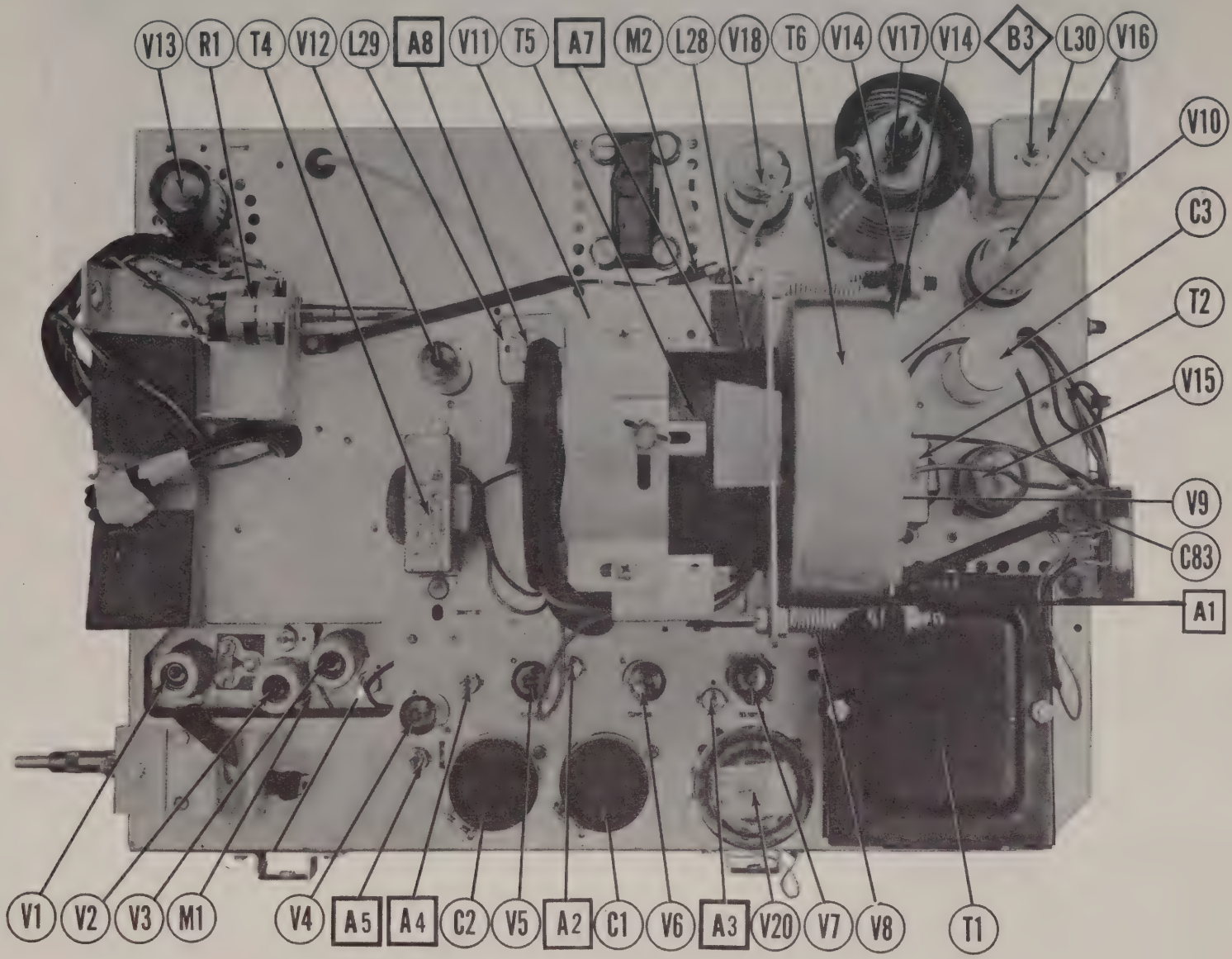
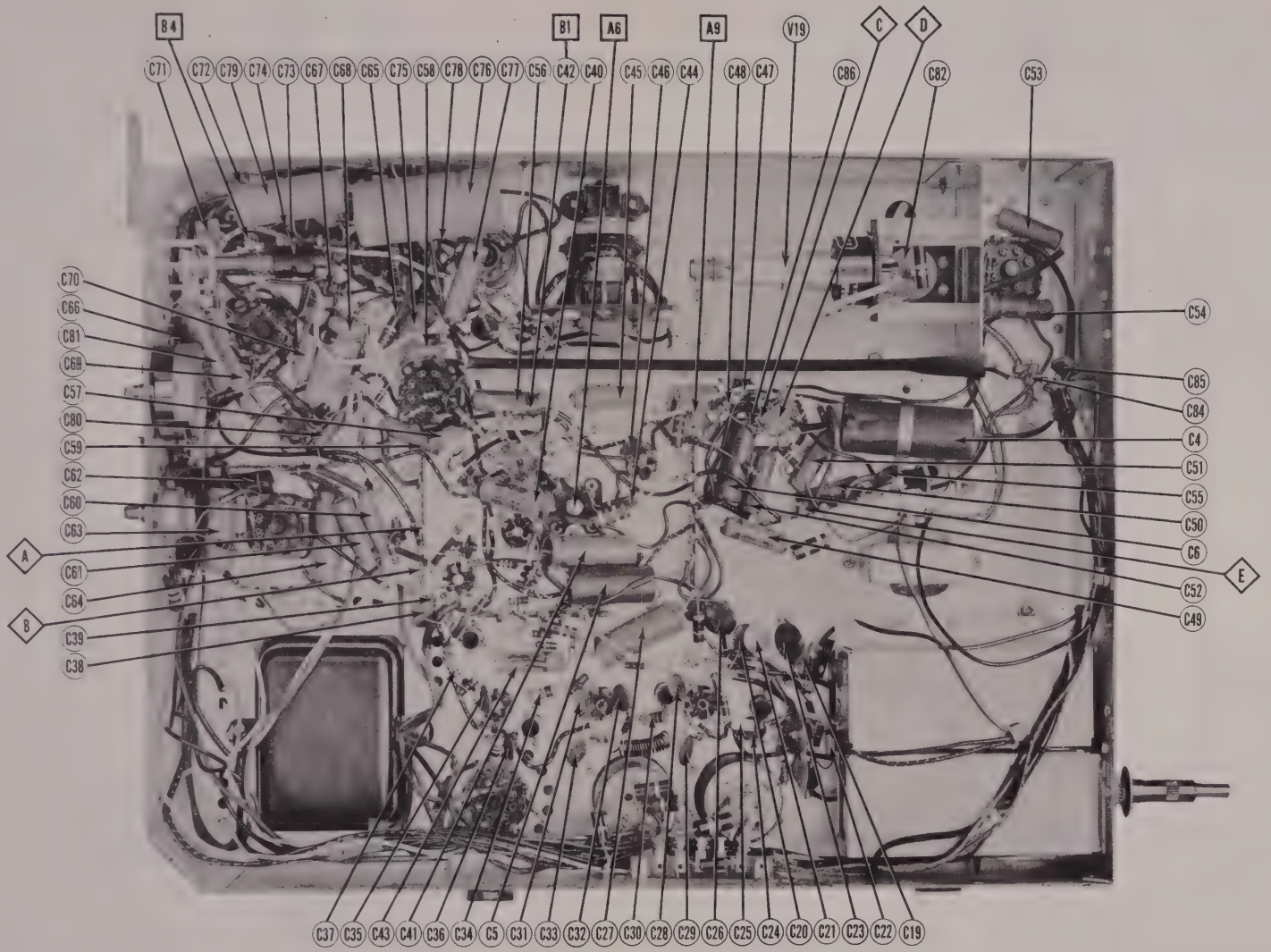
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
CROSLEY MODELS 10-404MU, M1U, 10-412MU, 10-418MU, 10-420MU

CROSLEY MODELS 10-404MU, M1U, 10-412MU, 10-418MU, 10-420MU

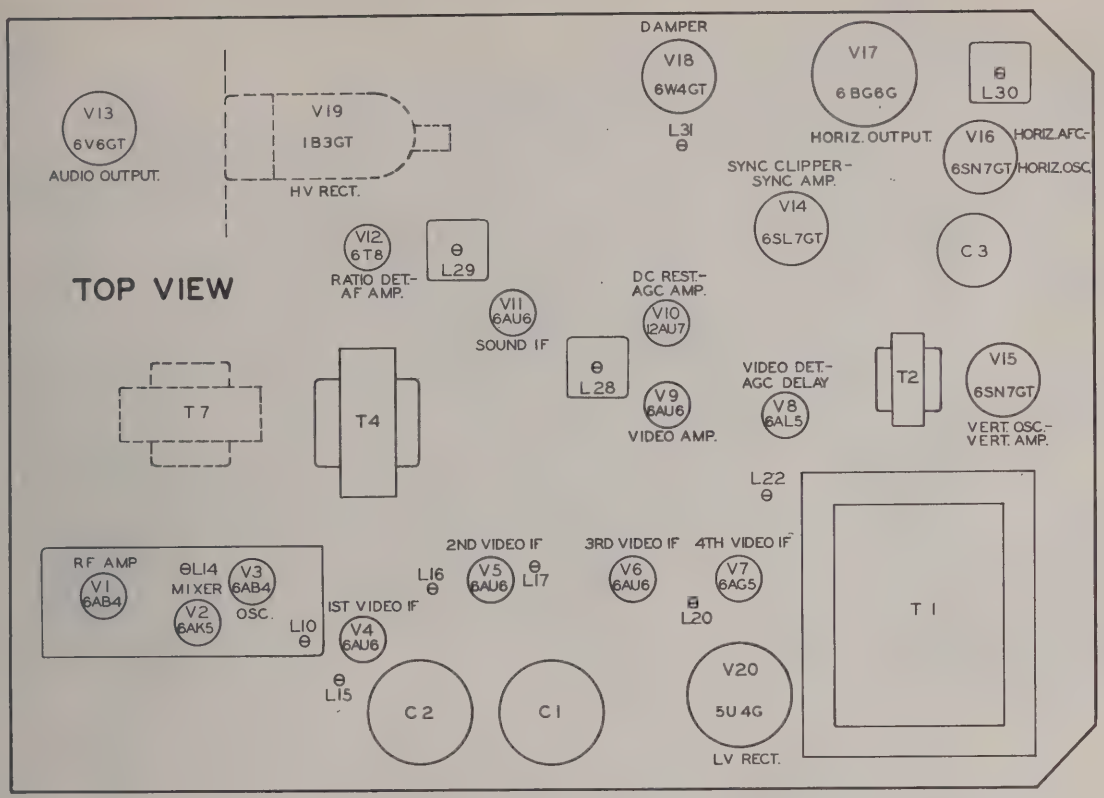


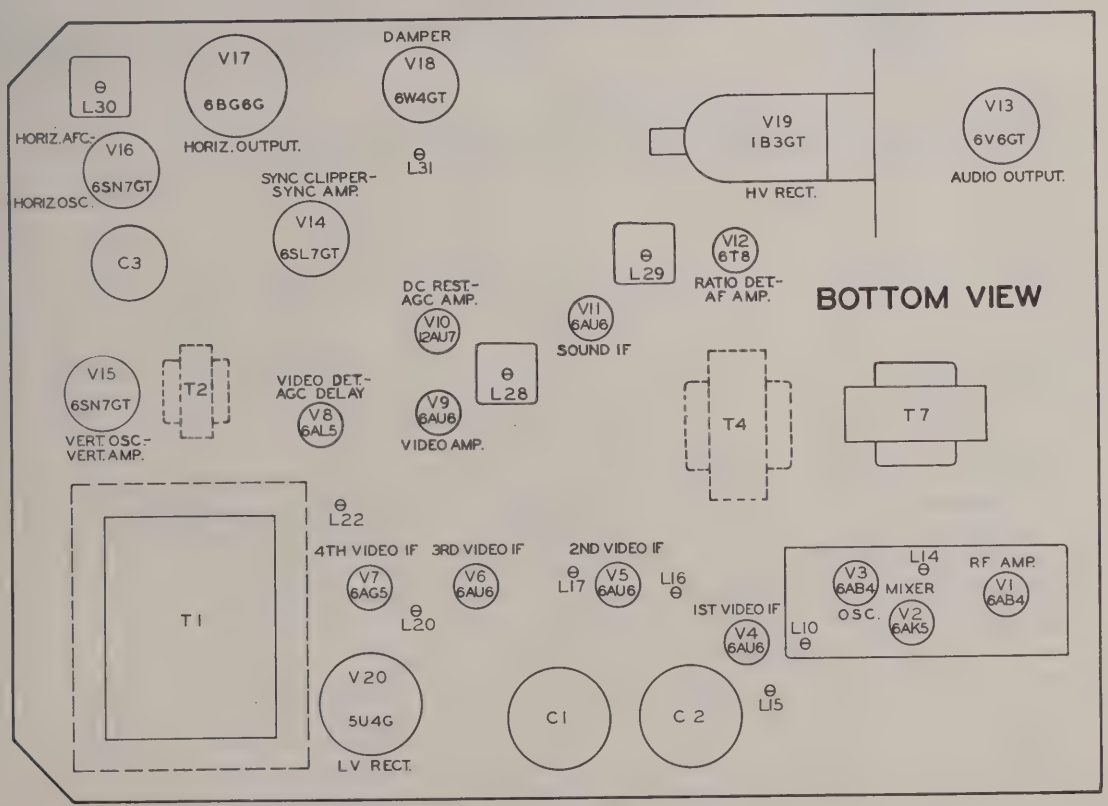
CHASSIS TOP VIEW

CROSLEY MODELS 10-404MU, M1U, 10-412MU, 10-418MU, 10-420MU



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To eliminate the high voltage shock hazard remove the horizontal output tube (V17) from its socket.

VIDEO IF ALIGNMENT

Remove the local oscillator tube (V3) from its socket to prevent erroneous indications.
Connect a short lead from the junction of R30 and C38 to the junction of R45 and R44.
It should be noted that the common lead of the VTVM is connected to -4 volts with respect to chassis, avoid touching or grounding the VTVM case.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	25.65MC (Unmod.)	Any	DC Probe to Point (A). Common to Point (B).	A1, A2	Adjust for maximum deflection. Attenuate signal generator to maintain 3.5 volt reading.
2.	Direct	"	23.7MC	"	"	A3, A4	"
3.	Direct	"	25MC	"	"	A5	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	24MC (10MC SWP)	22.9MC 26.4MC	Any	Vert. Amp. to Point (A). Low side to chassis.	A5	Adjust to place 26.4MC marker at 50% on the high frequency slope of the response curve as shown in figure 1. If necessary, SLIGHTLY retouch A1 thru A4 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect a matched pair of 100KΩ resistors (± 10%) in series between Points C and D. The junction of these resistors is alignment point (F) as shown on the schematic.
It should be noted that the common lead of the VTVM is connected to approximately 140 volts with respect to chassis. Avoid touching or grounding the VTVM case.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
5.	.01MFD	High side to pin 1 (Grid) of 6AG5 (V9). Low side to chassis.	4.5MC (Unmod.)	Any	DC Probe to Point (C). Common to Point (D).	A6, A7, A8	Adjust for maximum deflection.
6.	.01MFD	"	"	"	DC Probe to Point (E). Common to Point (F).	A9	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	.01MFD	High side to pin 1 (Grid) of 6AG5 (V9). Low side to chassis.	4.5MC (450KC SWP)	4.5MC	Any	Vert. Amp. to Point (C). Low side to chassis.	A6, A7, A8	Disconnect stabilizer capacitor C6. Adjust for maximum amplitude and symmetry as per figure 2.
6.	.01MFD	"	"	"	"	Vert. Amp. to Point (E). Low side to chassis.	A9	Reconnect capacitor C6. Adjust A9 to place 4.5MC at center of crossover lines as per figure 3. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines.

THE RF PORTION OF THIS RECEIVER HAS BEEN PROPERLY ALIGNED AT THE FACTORY AND IS VERY STABLE AND SHOULD NOT REQUIRE ADJUSTMENT IN THE FIELD.

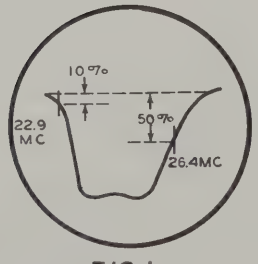


FIG.1

FIG. 2

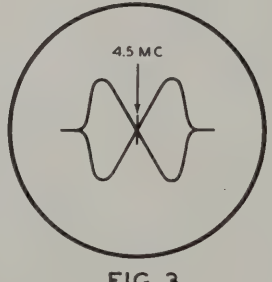
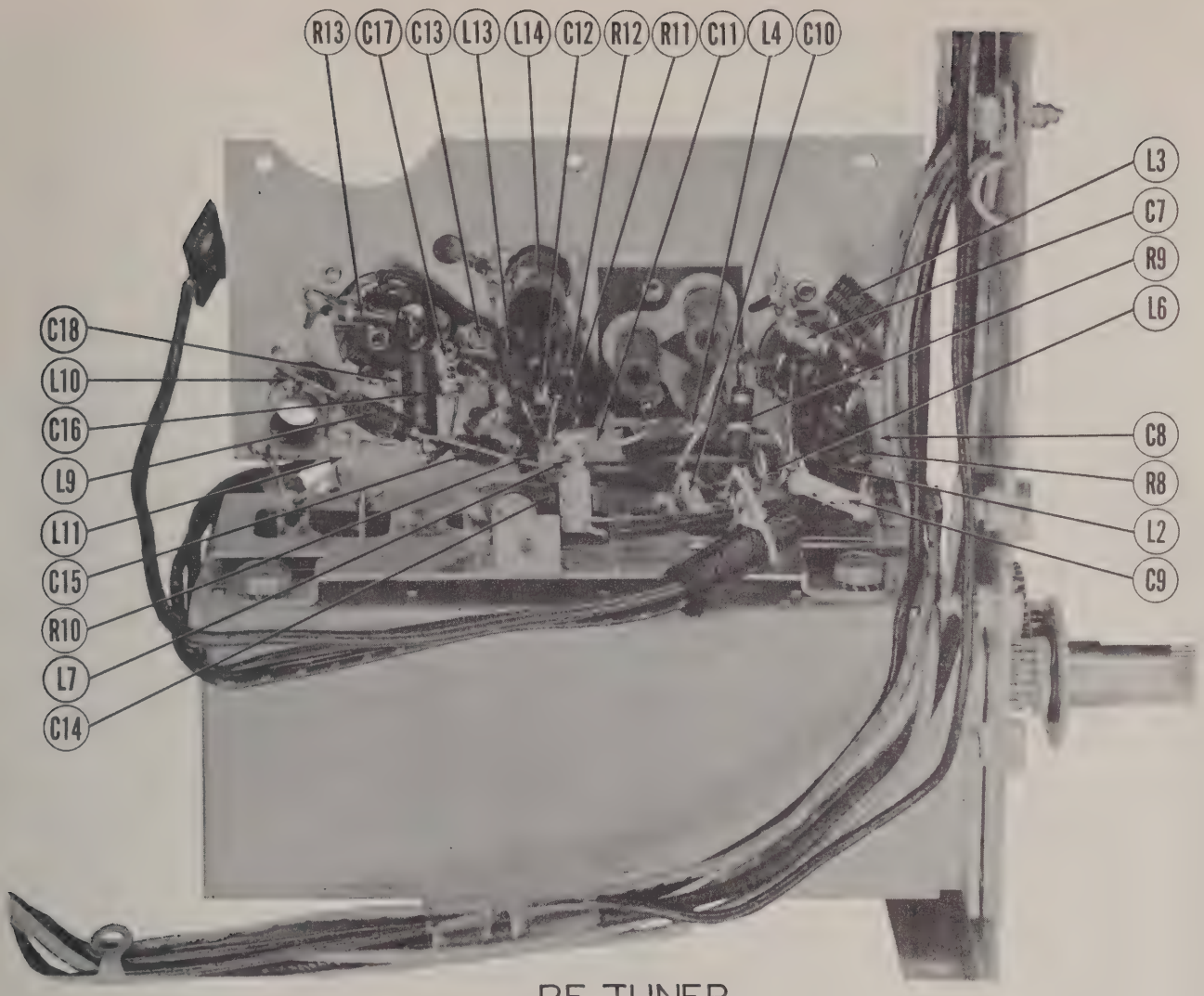


FIG. 3



RF TUNER
DISASSEMBLY INSTRUCTIONS

1. Remove three push-on type control knobs.
2. Remove six wood screws from rear cover. Lift from hinges.
3. Disconnect built-in antenna.
4. Disconnect speaker.
5. Remove two 1/4" hex head screws from on-off-volume and contrast controls.
6. Remove two 9/16" hex head bolts holding chassis to cabinet.
7. Remove one 5/16" hex head bolts holding front of chassis to cabinet.
8. Remove one 9/32" hex head bolt securing top portion of chassis to cabinet. Remove chassis.
9. Remove four 1/4" hex nuts holding speaker to chassis. Remove speaker.

FOR PICTURE TUBE REMOVAL FOLLOW INSTRUCTIONS ABOVE.

AGC ADJUSTMENT

Turn the set on and tune in a TV station.

Connect the vertical amplifier input of an oscilloscope across R30.

Adjust the spacing of the "GIMMICK" (B1) for a 3.5 volt peak to peak pattern on the scope.

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AB4	130VDC	0V	0V	6.3VAC	6.3VAC	-.7VDC	0V		
V 2	6AL5	-3.3VDC	0V	0V	6.3VAC	130VDC	55VDC	0V		
V 3	6AB4	130VDC	0V	0V	6.3VAC	0V	§-5VDC	0V		
V 4	6AU6	-1.8VDC	0V	6.3VAC	0V	130VDC	130VDC	.2VDC		
V 5	6AU6	-1.9VDC	0V	6.3VAC	0V	125VDC	125VDC	.2VDC		
V 6	6AU6	-.1VDC	0V	6.3VAC	0V	120VDC	120VDC	.8VDC		
V 7	6AG5	0V	1.2VDC	6.3VAC	0V	120VDC	120VDC	1.2VDC		
V 8	6AL5	.2VDC	-3.6VDC	6.3VAC	0V	-2.3VDC	0V	-.6VDC		
V 9	6AU6	-3VDC	0V	6.3VAC	0V	115VDC	175VDC	0V		
V 10	12AU7	6.6VDC	0V	1.4VDC	6.3VAC	6.3VAC	-5.2VDC	-2.2VDC	0V	0V
V 11	6AU6	▲-.6VDC	▲0V	▲0V	▲6.3VAC	▲43VDC	▲43VDC	▲0V		
V 12	6T8	▲-.6VDC	-1.3VDC	▲-.6VDC	▲0V	▲6.3VAC	▲0V	▲0V	▲-.8VDC	▲100VDC
V 13	6V6GT	▲0V	▲6.3VAC	▲180VDC	▲195VDC	▲-4.6VDC	▲100VDC	▲0V	▲0V	
V 14	6SL7GT	▲-.6VDC	▲165VDC	▲0V	▲-.4VDC	▲2.5VDC	▲.7VDC	▲6.3VAC	▲0Ω	
V 15	6SN7GT	-.4VDC -3.7VDC	150VDC 80VDC	0V	0V	340VDC	8VDC 17VDC	6.3VAC	0V	
V 16	6SN7GT	-85VDC	220VDC	0V	-2.6VDC	215VDC 115VDC	1.3VDC	6.3VAC	0V	
V 17	6BG6G	215VDC	0V	6.6VDC	-16VDC	-16VDC	500VDC	6.3VAC	270VDC	TOP CAP *
V 18	6W4GT	360VDC	360VDC	510VDC	0V	360VDC	0V	▲6.3VAC	▲0V	
V 19	1B3GT	* DO NOT MEASURE								
V 20	5U4G	0V	370VDC	0V	340VAC	0V	340VAC	0V	370VDC	
V 21	12LP4	0V	.4VDC	PIN 10 225VDC	PIN 11 18VDC	60VDC	PIN 12 6.3VAC			

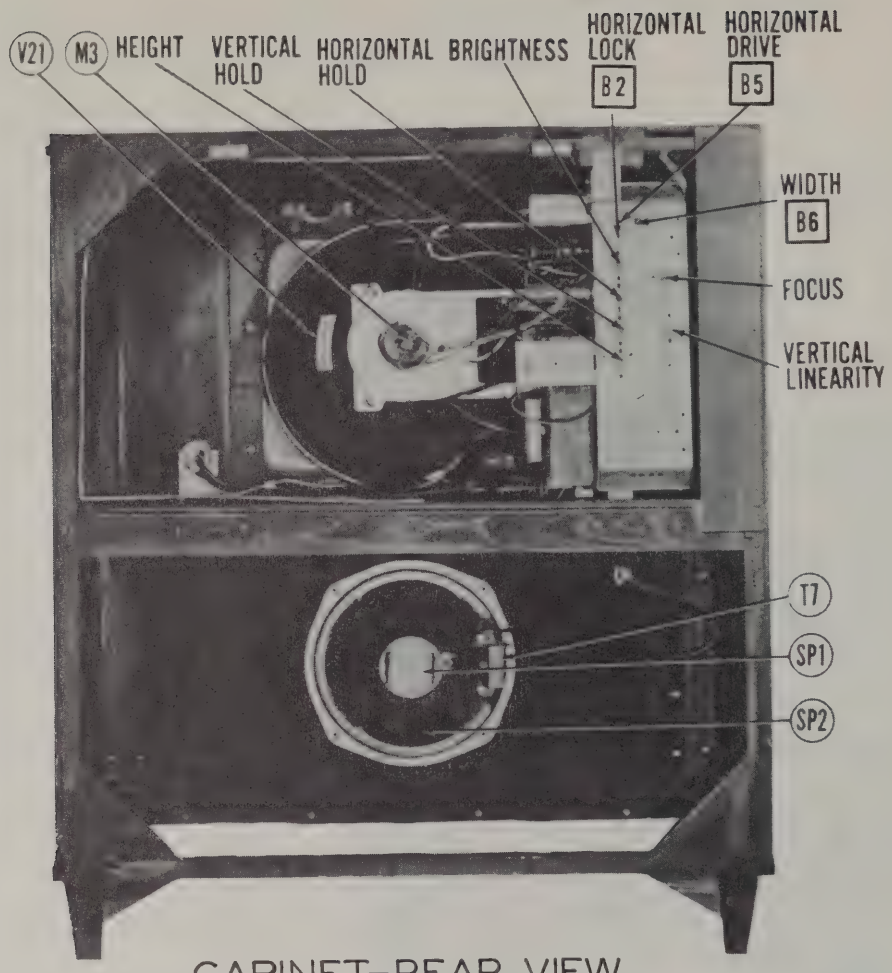
FOCUS CONTROL COUNTER CLOCKWISE
§ TAKEN WITH VACUUM TUBE VOLTMETER
▲ MEASURED FROM PIN 8 OF V13
* DO NOT MEASURE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AB4	▲200Ω	Inf.	0Ω	.1Ω	.1Ω	660KΩ	.1Ω		
V 2	6AK5	1 Meg.	0Ω	0Ω	.1Ω	▲200Ω	▲150KΩ	0Ω		
V 3	6AB4	▲200Ω	Inf.	0Ω	.1Ω	Inf.	12KΩ	0Ω		
V 4	6AU6	285KΩ	0Ω	.1Ω	0Ω	▲200Ω	▲200Ω	68Ω		
V 5	6AU6	270KΩ	0Ω	.1Ω	0Ω	▲300Ω	▲300Ω	68Ω		
V 6	6AU6	10KΩ	0Ω	.1Ω	0Ω	▲400Ω	▲400Ω	68Ω		
V 7	6AG5	.3Ω	100Ω	.1Ω	0Ω	▲500Ω	▲500Ω	100Ω		
V 8	6AL5	180Ω	22Ω	.1Ω	0Ω	5.6KΩ	0Ω	440KΩ		
V 9	6AU6	5.6KΩ	0Ω	.1Ω	0Ω	▲4.7KΩ	†27KΩ	0Ω		
V 10	12AU7	▲50KΩ	0Ω	300KΩ	.1Ω	.1Ω	110KΩ	105KΩ	0Ω	0Ω
V 11	6AU6	▲220KΩ	▲0Ω	▲0Ω	▲.1Ω	†30KΩ	†30KΩ	▲0Ω		
V 12	6T8	Inf.	▲18KΩ	Inf.	▲0Ω	▲.1Ω	Inf.	▲0Ω	▲10 Meg.	†100KΩ
V 13	6V6GT	Inf.	▲.1Ω	†910Ω	†550Ω	▲100KΩ	†100KΩ	▲0Ω	20KΩ	
V 14	6SL7GT	▲1 Meg.	†18KΩ	▲0Ω	▲3.3 Meg.	†140Ω	▲6.8KΩ	▲.1Ω	▲0Ω	
V 15	6SN7GT	1.2 Meg. 2.7 Meg.	#1.5 Meg. #4 Meg.	0Ω	2.2 Meg.	†6.5KΩ	5.5KΩ 560Ω	.1Ω	0Ω	
V 16	6SN7GT	250KΩ	#120KΩ	0Ω	1 Meg.	#110KΩ #130KΩ	300KΩ	.1Ω	0Ω	
V 17	6BG6G	#270KΩ	0Ω	82Ω	1 Meg.	1 Meg.	#6.5Ω	.1Ω	†16KΩ	TOP CAP #95Ω
V 18	6W4GT	†130Ω	†130Ω	140KΩ	Inf.	†160Ω	Inf.	Ω.1Ω	▲0Ω	
V 19	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP 155Ω
V 20	5U4G	Inf.	20KΩ	Inf.	40Ω	Inf.	40Ω	Inf.	20KΩ	
V 21	12LP4	0Ω	250KΩ	PIN 10 †12KΩ	PIN 11 5.5KΩ	PIN 12 .1Ω				

FOCUS CONTROL COUNTER CLOCKWISE
▲MEASURED FROM PIN 8 OF V13
† MEASURED FROM PIN 2 OF V20
# MEASURED FROM PIN 3 OF V18

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



CABINET–REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

HORIZONTAL OSCILLATOR ALIGNMENT

Connect a short across terminals 5 and 6 of L30.
Turn set on and tune in a TV station preferably a test pattern.
Turn the horizontal lock-in trimmer (B2) fully out (counter-clockwise).
Turn the horizontal hold control fully clockwise.
Adjust the horizontal frequency slug (B3) until the horizontal blanking signal appears as a single vertical bar in the raster.
Turn the horizontal hold control fully counter-clockwise and momentarily interrupt the signal by tuning to another channel and back again.
The picture should fall into sync after approximately 90^0 of clockwise rotation and should remain in sync for approximately 90^0 additional rotation.

HORIZONTAL WAVEFORM ADJUSTMENT

Remove the short from terminals 5 and 6 of L30.
Connect the vertical amplifier input of an oscilloscope thru 50MMF to terminal 5 of L30, connect the low side to chassis.
Adjust the waveform slug (B4) until the broad and narrow peaks are of equal amplitude as shown in figure 4. If necessary turn the horizontal hold control to keep the picture in sync during this adjustment.

HORIZONTAL LINEARITY ADJUSTMENTS

Turn the horizontal drive trimmer (B5) clockwise as far as possible without crowding the right half of the picture.
Adjust the width slug (B6) until the picture fills the mask horizontally.
Adjust the horizontal linearity slug (B7) until the picture is symmetrical from left to right. A readjustment of B5 may be necessary for optimum results.

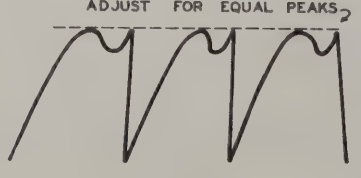
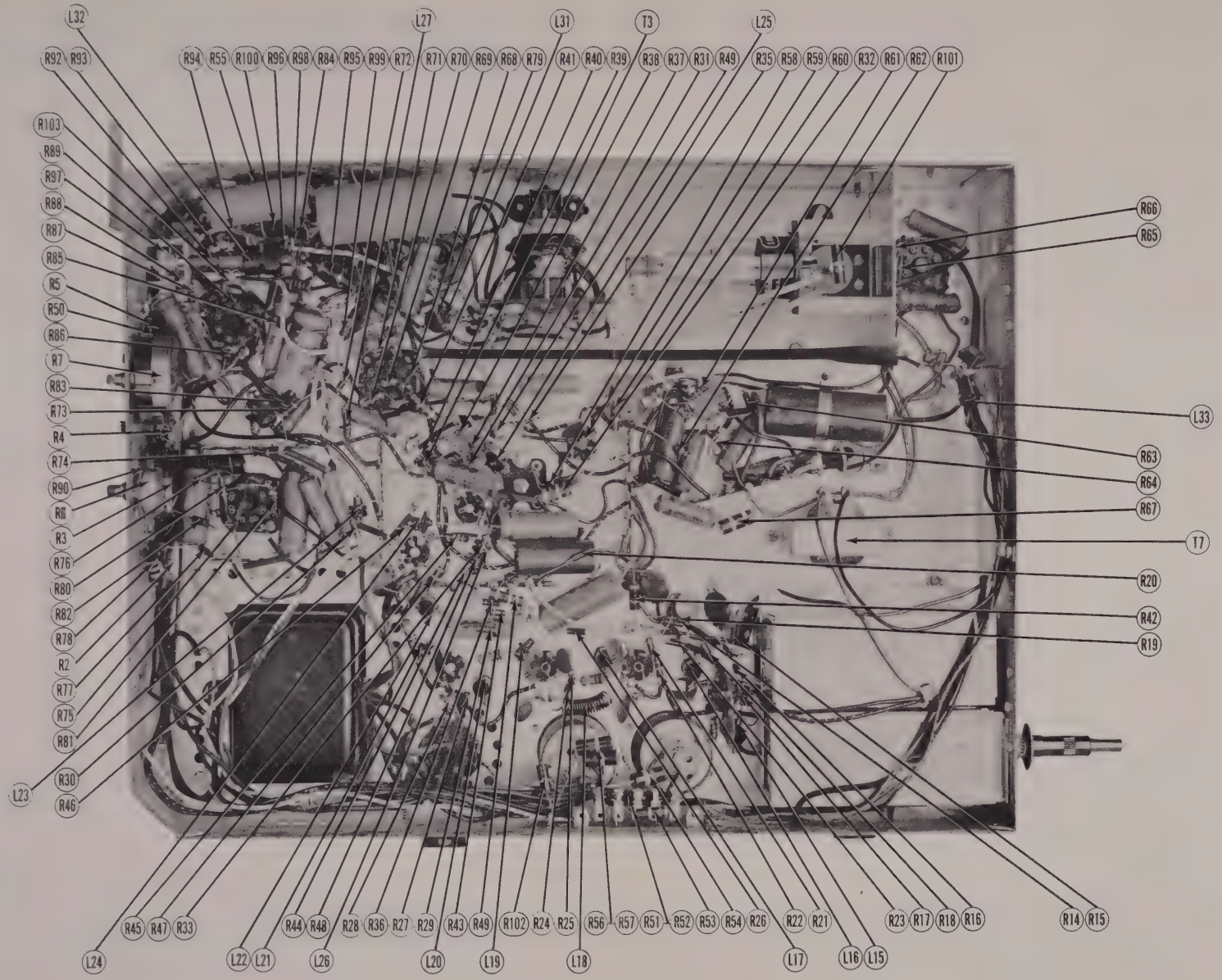


FIG. 4



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: CROSLEY PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6AB4	6AB4	5CE	
V2	Mixer	6AK5	6AK5	7BD	
V3	Oscillator	6AB4	6AB4	5CE	
V4	1st Video IF	6AU6	6AU6	7BK	
V5	2nd Video IF	6AU6	6AU6	7BK	
V6	3rd Video IF	6AU6	6AU6	7BK	
V7	4th Video IF	6AG5	6AG5	7BD	
V8	Video Det.-AGC Delay	6AL5	6AL5	6BT	
V9A	Video Amp.	6AU6	6AU6	7BK	Used in model 10-420MU
B	Video Amp.	6AG5	6AG5	7BD	Used in sets, models 10-404MU, 10-404M1U, 10-412MU, 10-418
V10	DC Rest.-AGC Amp.	12AU7	12AU7	9A	
V11	Sound IF Amp.	6AU6	6AU6	7BK	
V12	Ratio Det.-AF Amp.	6T8	6T8	9E	
V13	Audio Output	6V6GT	6V6GT	7AC	
V14	Sync. Clipper-Sync. Amp.	6SL7GT	6SL7GT	8BD	
V15	Vert. Osc.-Vert. Amp.	6SN7GT	6SN7GT	8BD	
V16	Hor. AFC-Hor. Osc.	6SN7GT	6SN7GT	8BD	
V17	Hor. Output	6BG6G	6BG6G	5BT	
V18	Damper	6W4GT	6W4GT	4CG	
V19	HV Rect.	1B3GT	1B3GT	3C	
V20	LV Rect.	5U4G	5U4G	5T	
V21A	Picture Tube	12LP4	12LP4	12D	
B	Picture Tube	12TP4	12TP4	12D	
C	Picture Tube	12QP4	12QP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CROSLEY PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	475	†B-147757	AF88X100R		UPE1CJ 23		TVL-2830	▲ Filter
B	40	475						TVA-1132	■ Filter
C	500	10							▲ Filter
C1A	40	475	†B-146632	AF88X		UP4450		TVL-2830	▲ Filter
B	40	475							▲ Filter
C1C	500	10	†B-146841	PRS1/500		BRH125A		TVA-1132	Filter
C2A	40	450	†	AF8X8F20B		UP9CJ1214		TVL-2830	▲ Filter
B	40	250						TVA-1310	■ Decoupling
C	100	25							▲ Vert. Output Cath.
C2A	40	475	†B-146633	AF88X		UP4450		TVL-2830	▲ Filter
B	40	475							▲ Decoupling
C3A	10	475	†						■ Vert. Osc. Dec.
B	10	475							Vert. Output Dec.
C	5	25							Hor. Output Cath.
C3A	10	475	†B-146723	AF22X20A		UP6CJ1197		TVL-2750	■ Vert. Osc. Dec.
B	10	475						TVA-1310	▲ Vert. Output Dec.
C2C	100	25							Vert. Output Cath.
C3C	5	25	†B-146944	PRS150/4		BR550		TVA-1303	Hor. Output Cath.
C4	40	300	B-146725	PRS450/40		BR4035		TVA-1611	Decoupling
C5	4	350	B-147047	PRS350/4		BR445		TVA-1601	V. Amp. Screen
C6	10	25	B-146883	PRS25/10		BR102A		TVA-1204	Stabilizing Cap.
C7	470		SI470	D6-471			GP2K-470	19C15	RF Fil. Bypass
C8	5000		SI5000	DD-502			811-005	29C1	AGC Filter
C9	1000		SI1000	D6-102			GP2L-001	19C1	AGC Filter
C10	1000		SI1000	D6-102			GP2L-001	19C1	RF Decoupling
C11	15			TCZ-15			NPOK-15	19C5	RF Coupling
C12	470		SI470	D6-471			GP2K-470	19C15	Mixer Screen
C13	470		SI470	D6-471			GP2K-470	19C15	Mixer Fil. Bypass
C14	1000		SI1000	D6-102			GP2L-001	19C1	RF Bypass
C15	1			TCZ-1					Osc. Coupling
C16	5		SI5NPO	TCZ-4.7			NPOK-5		Osc. Grid Cap.
C17	6						N330K-6		Fixed Trimmer
C18	4						N330K-4		Fixed Trimmer
C19	5000		C-146675-2	BPD-005	DD-502	1D5D5	811-005	29C1	AGC Filter
C20	5000		C-146675-2	BPD-005	DD-502	1D5D5	811-005	29C1	RF Bypass
C21	5000		C-146675-2	BPD-005	DD-502	1D5D5	811-005	29C1	RF Bypass
C22	47		C-137727-108	SI47	D6-470	5W5Q5	GP1K-47	19C25	IF Coupling *
C23	10000		C-146675-13	BPD-01	DD-103	PTE6S1	811-01	36C1	AGC Filter
C24	5000		C-146675-2	BPD-005	DD-502	1D5D5	811-005	29C1	1st V. IF Dec.
C25	47		C-137727-108	SI47	D6-470	5W5Q5	GP1K-47	19C25	IF Coupling *
C26	10000		C-146675-13	BPD-01	DD-103	PTE6S1	811-01	36C1	AGC Filter
C27	.25	200	39001-87	P488-25		GT2P25		2TM-P25	AGC Filter
C28	5000		C-146675-2	BPD-005	DD-502	1D5D5	811-005	29C1	2nd V. IF Dec.
C29	5000		C-146675-2	BPD-005	DD-502	1D5D5	811-005	29C1	2nd V. IF Fil.
C30	47		C-137727-108	SI47	D6-470	5W5Q5	GP1K-47	19C25	IF Coupling *
C31	5000		C-146675-2	BPD-005	DD-502	1D5D5	811-005	29C1	3rd V. IF Dec.
C32	5000		C-146675-2	BPD-005	DD-502	1D5D5	811-005	29C1	3rd V. IF Cath.
C33	5000		C-146675-2	BPD-005	DD-502	1D5D5	811-005	29C1	3rd V. IF Fil.
C34	47		C-137727-108	SI47	D6-470	5W5Q5	GP1K-47	19C25	IF Coupling *
C35	5000		C-146675-2	BPD-005	DD-502	1D5D5	811-005	29C1	4th V. IF Dec.
C36	5000		C-146675-2	BPD-005	DD-502	1D5D5	811-005	29C1	4th V. IF Cath.
C37	47		C-137727-108	SI47	D6-470	5W5Q5	GP1K-47	19C25	IF Coupling *
C38	5000		C-146675-2	BPD-005	DD-502	1D5D5	811-005	29C1	RF Bypass
C39	5		C-137727-103	SI5	TCZ-4.7	5W5V5	GP1K-5	MS-55	V. Diode Filter
C40	.05	400	39001-17	P488-05	DF-503	PTE4S5		4TM-S5	Video Coupling
C41	.1	400	39001-19	P488-1	DF-104	PTE4P1		4TM-P1	Video Coupling
C42	3		AW-147000						Hor. Sweep Coupling
C43	.015	200	39001-14	P288-015		PTE6S15		6TM-S15	AGC Delay Dec.
C44	100		C-137727-108	SI100	D6-101	5W5T1	GP1K-100	19C11	S. IF Coupling
C45	.02	400	39001-80	P488-02	DF-203	PTE4S2		4TM-S2	S. IF Decoupling
C46	5000		C-146675-2	BPD-005	DD-502	1D5D5	811-005	29C1	S. IF Decoupling
C47	5000		C-146675-2	BPD-005	DD-502	1D5D5	811-005	29C1	RF Bypass
C48	1000		C-137727-110	SI1000	D6-102	1W5D1	GP2L-001	19C1	Diode Load Cap.

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CROSLEY PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C49	.005	600	39001-11	P688-005	D6-502	PTE6D5	811-005	6TM-D5	De-emphasis
C50	.01	400	39001-13	P488-01	D6-103	PTE4S1	811-01	4TM-S1	Audio Coupling
C51	.01	400	39001-13	P488-01	D6-103	PTE4S1	811-01	4TM-S1	Audio Coupling
C52	.00025	600	39001-73	1468-00025	D6-251	5W5T25	GP2K-250	6TM-T25	AF Amp. Plate
C53	.02	400	39001-80	P488-02	DF-203	PTE4S2		4TM-S2	Audio Coupling
C54	.005	600	39001-11	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Output Plate
C55	5000		C-144675-2	BPD-005	DD-502	1D5D5	811-005	29C1	RF Bypass
C56	.01	400	39477-41	P488-01	D6-103	PTE4S1	811-01	4TM-S1	Sync. Coupling
C57	120	500	B-137498-17	1469-00015	D6-121	5R5T15	GP2K-120	MS-315	Sync. Coupling
C58	390	500	B-137498-28	1469-0004	D6-391	5R5T4	GP2K-390	MS-34	Sync. Amp. Cath.
C59	.002	600	39001-74	P688-002	D6-202	PTE6D2	GP2M-002	6TM-D2	Integrator Net.
C60	.005	600	39001-11	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Integrator Net.
C61	.005	600	39001-11	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Integrator Net.
C62	.0047	600	39478-39	P688-0047	D6-472	PTE6D5	GP2M-0047	6TM-D47	Vert. Osc. Grid
C63	.1	400	C-146434-3	P488-1		PTE4P1		4TM-P1	Vert. Discharge
C64	.1	400	39001-19	P488-1	DF-104	PTE4P1		4TM-P1	Vert. Sweep Coupling
C65	120	500	B-137498-17	1469-00015	D6-121	5R5T15	GP2K-120	MS-315	Hor. Sync. Coupling
C66	.0022	600	39477-37	P688-0022	D6-222	PTE6D2	GP2M-0022	6TM-D22	Hor. Sync. Coupling
C67	5		C-137727-103	SI5	TCZ-4.7	5W5V5	GP1K-5	MS-55	Hor. Feedback
C68	.25	200	39001-87	P488-25		GT2P25		2TM-P25	AFC Filter
C69	.02	200	39001-80	P488-02	DF-203	PTE4S2		4TM-S2	AFC Filter
C70	.05	400	39001-17	P488-05	DF-503	PTE4S5		4TM-S5	Hor. AFC Plate
C71	200	1000	B-137498-47	1469-HV-0002					Hor. Osc. Grid
C72	.01	400	39001-13	P488-01		PTE4S1		4TM-S1	Fixed Trimmer
C73	2000	500	B-137498-48	1464-002		1R5D2		MS-32	Hor. Discharge
C74	390	500	B-137498-28	1468-0004	D6-391	5W5T4	GP2K-390	1FM-34	Hor. Sweep Coupling
C75	.05	200	39001-17	P288-05	DF-503	PTE4S5		2TM-S5	Hor. Output Screen
C76	.5	600	39001-23	684-5		GT6P5			Decoupling
C77	.05	200	C-146434-4	P288-05		PTE4S5		2TM-S5	Damper Filter
C78	.02	200	C-146434-7	P488-02		PTE4S2		2TM-S5	Damper Filter
C79	.5	200	B-144899-2	P288-5		GT2P5		2TM-P5	Hor. Sweep Coupling
C80	.005	600	39001-11	P688-005	D6-502	PTE6D5	811-005	6TM-D5	RF Bypass
C81	.1	200	39001-19	P288-1	DF-104	PTE4P1		2TM-P1	Pic. Tube Cath. Byp.
C82	500	10000	B-137477-1	HV30B	TV1-501				HV Filter
C83	220	1500	W-160111	1469-HV-00025					Line Filter
C84	220	1500	W-160111	1469-HV-00025					Line Filter
C85	220	1500	W-160111	1469-HV-00025					Line Filter
C86	2.2		B-137398-4		TCZ-2.2				Balancing

* Some models use 100MMF in this application.
† Used only in model 10-420MU
‡ Used only in models 10-404MU, 10-404M1U, 10-412MU and 10-418MU.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CROSLEY PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	REPLACEMENT DATA: CENTRALAB PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	C-146856	Concentrikit B13-137 *	RTV-24	SBB-537-S	Volume control-front
B	1000Ω	½		Bll-108 *			Contrast control-rear
C	Shaft End			E-187 *			Attach per instr. in "Concentrikit".
D	Switch			76-1 *			Attach per instr. in "Concentrikit".
R2A	2.5 Meg.	½	B-144259	Qll-239	AG-84-S	B-83	Height control
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Attach to R2A per instructions
R3A	1.5 Meg.	½	B-146799	Qll-138	AG-83-S	B-31	Vert. hold control
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not. Req.	Attach to R3A per instructions
R4A	50KΩ	½	B-146797	Qll-123	AG-44-S	B-31	Horiz. hold control
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Attach to R4A per instructions
R5A	40KΩ	½	B-146798		AG-43-S		Brightness control
B	Shaft		Not Req.		FKS-1/4		Attach to R5A per instructions
R6A	5000Ω	½	B-144260	Qll-114	AG-18-S	AN-10	Vert. linearity control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R6A per instructions
R7	650Ω	4	B-147083		RTV-25	SVP-992	Focus control-Wire Wound-See Note1

* Additonal parts to be used with "Concentrikit".
Note 1. Model 10-404MU uses a 1500Ω, 4 watt, wire wound control, obtainable under Mfgr's Part #B-147079.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CROSLEY PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED
R8	220KΩ	½	39374-53		AGC Network
R9	3900Ω	½	39374-32	BTS-3900	RF Amp. Plate Coil Shunt
R10	1 Meg.	½	39374-61		Mixer Grid
R11	150KΩ	½	39374-51		Mixer Screen
R12	10KΩ	½	39374-37		Mixer Plate Coil Shunt
R13	12KΩ	½	39374-38		Osc. Grid
R14	100Ω 20%	½	39373-14	BTS-100	Decoupling
R15	1000Ω 20%	½	39373-33	BTS-1000	AGC Network
R16	15KΩ	½	39374-77		1st Video IF Amp. Grid
R17	68Ω	½	39374-11		1st Video IF Amp. Cathode
R18	100Ω 20%	½	39373-14	BTS-100	1st Video IF Amp. Decoupling
R19	10KΩ 20%	½	39373-54		AGC Network
R20	100Ω 20%	½	39373-14	BTS-100	Decoupling
R21	8200Ω	½	39375-71		2nd Video IF Amp. Grid
R22	68Ω	½	39374-11		2nd Video IF Amp. Cathode
R23	100Ω 20%	½	39373-14	BTS-100	2nd Video IF Amp. Decoupling
R24	10KΩ 5%	½	39375-73		3rd Video IF Amp. Grid
R25	68Ω	½	39374-11		3rd Video IF Amp. Cathode
R26	100Ω 20%	½	39373-14	BTS-100	3rd Video IF Amp. Decoupling
R27	10KΩ 5%	½	39375-73		4th Video IF Amp. Grid Coil Shunt
R28	100Ω	½	39374-13	BTS-100	4th Video IF Amp. Cathode
R29	100Ω 20%	½	39373-14	BTS-100	4th Video IF Amp. Decoupling
R30	5600Ω 5%	½	39375-67	BTS-5600-5%	Video Det. Diode Load
R31	68KΩ	1	39374-135	BTA-68K	Voltage Divider
R32	39KΩ	2	39374-220	BTB-39K	Video Amp. Screen
R33	6800Ω	½	39374-35	BTS-6800	Video Peaking Coil Shunt
R34	4700Ω 5%	1	39375-213	BTA-4700-5%	Video Amp. Plate
R35	820KΩ	½	39374-60	BTS-820K	Voltage Divider
R36	3300Ω	½	39374-31	BTS-3300	Current Limiting

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CROSLEY PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R37	150KΩ	½	39374-51	BTS-150K	DC Rest. Load
R38	150KΩ	½	39374-51	BTS-150K	DC Rest. Load
R39	100KΩ	½	39374-49	BTS-100K	Picture Tube Grid
R40	100KΩ	½	39374-49	BTS-100K	AGC Amp. Grid
R41	27KΩ	1		BTA-27K	Voltage Divider-See Note 2
R42	8200Ω	1	39374-48	BTA-8200	AGC Network
R43	100KΩ 5%	½	39374-49	BTS-100K-5%	AGC Network
R44	150KΩ	½	39374-51	BTS-150K	AGC Network
R45	180KΩ	½	39374-52	BTS-180K	AGC Network
R46	3.9 Meg.	½	39374-75	BTS-3.9 Meg.	Voltage Divider
R47	180Ω	½	39374-16	BTS-180	AGC Delay Network
R48	150KΩ	½	39374-51	BTS-150K	AGC Delay Network
R49	47KΩ	½	39374-45	BTS-47K	Voltage Divider
R50	1800Ω	2	39374-28	BTS-1800	Voltage Divider
R51	39KΩ	2	39374-220	BTB-39K	Voltage Divider
R52	33KΩ	2	39374-219	BTB-33K	Voltage Divider
R53	4700Ω	1	39374-121	BTA-4700	Brightness Control Shunt
R54	12KΩ	2	39374-214	BTB-12K	Acc. Anode Load
R55	22Ω	1	39374-93	BW-1-22	Centering Network-See Note 3
R56	220Ω	2	39374-193	BW-2-220	Focus Coil Shunt
R57	220Ω	2	39374-193	BW-2-220	Focus Coil Shunt
R58	2200Ω 20%	½	39373-80		Sound IF Amp. Grid
R59	47KΩ	½	39374-45		Sound IF Amp. Screen
R60	56KΩ	1	39374-134		Sound IF Amp. Decoupling
R61	18KΩ 5%	½	39375-79	BTS-18K-5%	Ratio Det. Diode Load
R62	27KΩ	½	39374-42	BTS-27K	De-emphasis
R63	10 Meg. 20%	½	39373-107	BTS-10 Meg.	AF Amp. Grid
R64	100KΩ	½	39374-49	BTS-100K	AF Amp. Plate
R65	100KΩ 5%	½	39375-97	BTS-100K-5%	Voltage Divider
R66	2.2 Meg. 5%	2	39375-129	BTS-2.2 Meg. 5%	Audio Output Grid
R67	390Ω	2	39374-196	BTB-390	Audio Output Decoupling
R68	1 Meg. 20%	½	39373-92	BTS-1 Meg.	Sync. Clipper Grid
R69	18KΩ	½	39374-40	BTS-18K	Sync. Clipper Plate
R70	3.3 Meg.	½	39374-100	BTS-3.3 Meg.	Sync. Amp. Grid
R71	6800Ω	½	39374-35	BTS-6800	Sync. Amp. Cathode
R72	22KΩ	½	39374-41	BTS-22K	Integrator
R73	8200Ω	½	39374-36	BTS-8200	Integrator
R74	8200Ω	½	39374-36	BTS-8200	Integrator
R75	10KΩ 20%	½	39373-54	BTS-10K	Vert. Osc. Transformer Shunt
R76	1.2 Meg.	½	39374-63	BTS-1.2 Meg.	Vert. Osc. Grid
R77	1.5 Meg.	½	39374-65	BTS-1.5 Meg.	Vert. Osc. Plate
R78	270KΩ	1	39374-142	BTA-270K	Voltage Divider
R79	56KΩ	½	39374-46	BTS-56K	Decoupling
R80	3300Ω	½	39374-33	BTS-3300	Vert. Peaking
R81	2.2 Meg.	½	39374-69	BTS-2.2 Meg.	Vert. Amp. Grid
R82	560Ω	½	39374-22	BTS-560	Vert. Amp. Cathode
R83	4700Ω	1	39374-121	BTA-4700	Vert. Amp. Decoupling-See Note 4
R84	150KΩ	½	39374-51	BTS-150K	Horiz. AFC Filter Network
R85	8200Ω	1	39374-36	BTA-8200	Horiz. AFC Filter Network
R86	820KΩ	½	39374-60	BTS-820K	Horiz. AFC Grid
R87	150KΩ	½	39374-51	BTS-150K	Horiz. AFC Cathode
R88	150KΩ	½	39374-51	BTS-150K	Horiz. AFC Cathode
R89	3.4 Meg.	½	39374-71	BTS-3.3 Meg.	Voltage Divider-See Notes 5 and 6
R90	68KΩ	½	39374-47	BTS-68K	Voltage Divider
R91	150KΩ	1	39374-139	BTA-150K	Voltage Divider
R92	100KΩ 5%	½	39375-97	BTS-100K-5%	Horiz. Osc. Grid
R93	10KΩ	½	39374-37	BTS-10K	Horiz. Osc. Transformer Shunt
R94	22KΩ	½	39374-41	BTS-22K	Horiz. Osc. Transformer Shunt
R95	120KΩ	1	39374-138	BTA-120K	Horiz. Osc. Plate
R96	47Ω 20%	½	39373-9		Parasitic Suppressor
R97	1 Meg. 20%	½	39373-92	BTS-1 Meg.	Horiz. Output Grid
R98	82Ω	1	39374-100	BW-1-82	Horiz. Output Cathode
R99	15KΩ	1	39374-127	BTA-15K	Horiz. Output Screen
R100	1000Ω	½	39374-25	BTS-1000	Decoupling
R101	220KΩ	1	39374-141		HV Filter
R102	22Ω	½	39374-93	BW-1-22	Bias Network
R103	560KΩ	½	39374-58	BTS-560K	Feedback

Note 2. Some models use a 56KΩ resistor in this application.
Note 3. Not used in all models.
Note 4. Some models use a 5600Ω resistor in this application.
Note 5. Some models use two 6.8 Meg. resistor in parallel in this application.
Note 6. Some models use a 2.7 Meg. resistor in this application.

SPEAKER

ITEM No.	RATINGS: FIELD. RES.	RATINGS: V. C. IMP.	REPLACEMENT DATA: CROSLEY PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1A	FM	4.6Ω	C-147265	ST-119 13 16 MOD. P10-T	10A4A 13	13 Remount filter choke. 16 Replace output transformer to match 6-8Ω voice coil.
B	50Ω	4.3Ω	AD-146528		69E508	
	CONE DIA.	V. C. DIA.				
SP2A	9 1/2"	1"				
B	4" x 6"	9/16"				

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: CROSLEY PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC @ 1.4A	760VCT @ .150ADC	5VAC @ 3A	6.3VAC @ 5.5A SEC. 4 6.3VAC @ 2.8A	C-147682 ①	P-8314 15 P-5014 12	P-3067 14 15	PH-145 F-633 12
					C-146683 ②			

① Used in models 10-404MU, 10-404M1U, 10-420MU
② Used in models 10-412MU, 10-418MU.
12 Mount in space available and use for SEC. #4
14 Add series resistor to reduce plate voltage
15 Drill new mounting holes.

PARTS LIST CONTINUED ON PAGE 15

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA CROSLEY PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	176Ω	720Ω	B-146842-1	A-8111	A-3000	TBO-1	Vert. Block Osc. Trans.
T3	125Ω	2.3Ω CT	AC-147552				Hor. Output Trans.
	Tap ⓐ 55Ω	SEC. 2 7.5Ω					
		Tap ⓐ 4.1Ω					
		SEC. 3 0Ω					
T4	1100Ω		B-147824 ③	A-8123	A-3037	TSO-5 ⑤	Vert. Output Trans.
	Tap ⓐ 11Ω						
	660Ω	20Ω	B-146989 ④	A-8112 ⑤	A-3036 ⑤	TSO-5 ⑤	Vert. Output Trans.
T5A	14Ω		AB-146321 ⑥	DY-7	MF-2		Hor. Deflection Yoke
B	65Ω		AB-147631 ⑦				Vert. Deflection Yoke
			AB-147560 ⑧				Deflection Yoke
			⑨				Deflection Yoke
T6	245Ω		AB-147071 10				Focus Coil
	256Ω		AB-146758 11				Focus Coil
	240Ω						

③ Used in model 10-420MU
④ Used in models 10-404MU, 10-404M1U, 10-412MU, 10-418MU.
⑤ Drill one new mounting hole.
⑥ Used in model 10-420MU.
⑦ Used in model 10-404MU, 10-404M1U.
⑧ Used in model 10-412MU, 10-418MU.
⑨ Used in model 10-420MU.
10 Used in model 10-404M1U.
11 Used in model 10-404MU, 10-412MU, 10-418MU.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA CROSLEY PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T7	5400Ω	4.6Ω	360Ω	.6Ω	B-142890	A-3849	A-3019	RO-9 ⑤	⑤ Drill one new mounting hole.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D.C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ↵)	REPLACEMENT DATA CROSLEY PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.150ADC	52Ω	1 Henry	Part of SP1		C-2994	R-7150	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA CROSLEY PART No.	MEISSNER PART No.	NOTES
L2	Ant. Shunt	.1Ω		AW-146735		
L3	Fil. Choke	0Ω		AW-146858		
L4	RF End Inductor	0Ω		AW-146985		
L5	RF Coil	0Ω		D-146656		Includes L8, L12
L6	RF Coupling	0Ω		AW-146988		
L7	Mixer Grid End Inductor	0Ω		AW-146987		
L8	Mixer Grid	0Ω				Part of L5
L9	RF Choke	0Ω		AW-147015		
L10	Osc. Shunt	0Ω		AW-146753		
L11	Osc. Coil End Inductor	0Ω		AW-146986		
L12	Osc. Coil	0Ω				Part of L5
L13	RF Choke	.1Ω		AW-146735		
L14	1st Video IF	1.2Ω		AW-146755		
L15	1st Video IF Coupling	.3Ω		AW-146763		
L16	2nd Video IF	.3Ω		AW-146582		Yellow dot
L17	3rd Video IF	.3Ω		AW-146583		Red dot
L18	Fil. Choke	0Ω		AW-146855		
L19	RF Choke	4.6Ω		AW-146570		White dot
L20	4th Video IF	.3Ω		AW-146582		Yellow dot
L21	RF Choke	4.6Ω		AW-146570		White dot
L22	5th Video IF	.3Ω		AW-147022		Orange dot
L23	RF Choke	18Ω		AW-146889		
L24	Peaking	10Ω		AW-147043		Wound on 22KΩ resistor
L25	Peaking	10Ω		AW-147043		Wound on 22KΩ resistor
L26	RF Choke	18Ω		AW-146889		
L27	RF Choke	4.6Ω		AW-146570		White dot
L28	Sound IF	2.6Ω	2.3Ω	AC-146782		
L29	Ratio Det. Trans.	4.3Ω	.2Ω	C-146874		
L30	Horiz. Osc. Trans.	140Ω	38Ω	AC-146698		
L31	Horiz. Lin.	11Ω		AW-147880		
L32	Width Coil	3.4Ω		AW-146984		
L33	RF Choke	2.2Ω		AW-147575		

MISCELLANEOUS

ITEM No.	PART NAME	CROSLEY PART No.	NOTES
M1	RF Tuner	AW-146843	Complete
M2	Fuse	W-144898-1	.2A 250V Type GJC
M3A	Ion Trap	B-146480	Models 10-404M1U, 10-412MU, 10-418MU
B	Ion Trap	B-146479	Model 10-404MU
B5 & B2	Trimmer	B-132386-16	2 section. Horiz. drive 10-160MMF, Horiz. lock 30-260MMF
	Antenna Assembly	AD-147658	Models 10-412MU, 10-418MU
	Antenna Assembly	AD-147708	Models 10-404MU, 10-404M1U
	Dial	D-147570	Tuning, Models 10-412MU, 10-418MU
	Dial	D-147569	Volume, Models 10-412MU, 10-418MU
	Escutcheon	AC-147679	Dial, Models 10-404MU, 10-404M1U
	Escutcheon	AC-147680	Volume-Contrast, Models 10-404MU, 10-404M1U
	Knob	AW-146638-1	Tuning, Models 10-404MU, 10-404M1U, 10-412MU, 10-418MU
	Knob	AW-146637-1	Volume, Models 10-404MU, 10-404M1U, 10-412MU, 10-418MU
	Knob	AW-146640-1	Contrast, Models 10-404MU, 10-404M1U, 10-412MU, 10-418MU
	Safety Glass	R-147584	Models 10-412MU, 10-418MU
	Safety Glass	R-147687	Models 10-404MU, 10-404M1U

PHOTOFACT* Folder

FADA MODELS
R-1025, R-1050

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MODEL R-1025

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MODELS R-1025, R-1050

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MODELS R-1025, R-1050

FADA MODEL R-1025

TRADE NAME	Fada, Models R-1025, R-1050
MANUFACTURER	Fada Radio and Electric Co. Inc., 525 Main St., Belleville, New Jersey
TYPE SET	Television Receiver
TUBES	Twenty Five

POWER SUPPLY 110-120 Volts AC-60 Cycle RATING 2.4 Amp. at 117 Volts AC
TUNING RANGE—Channels 2 thru 13

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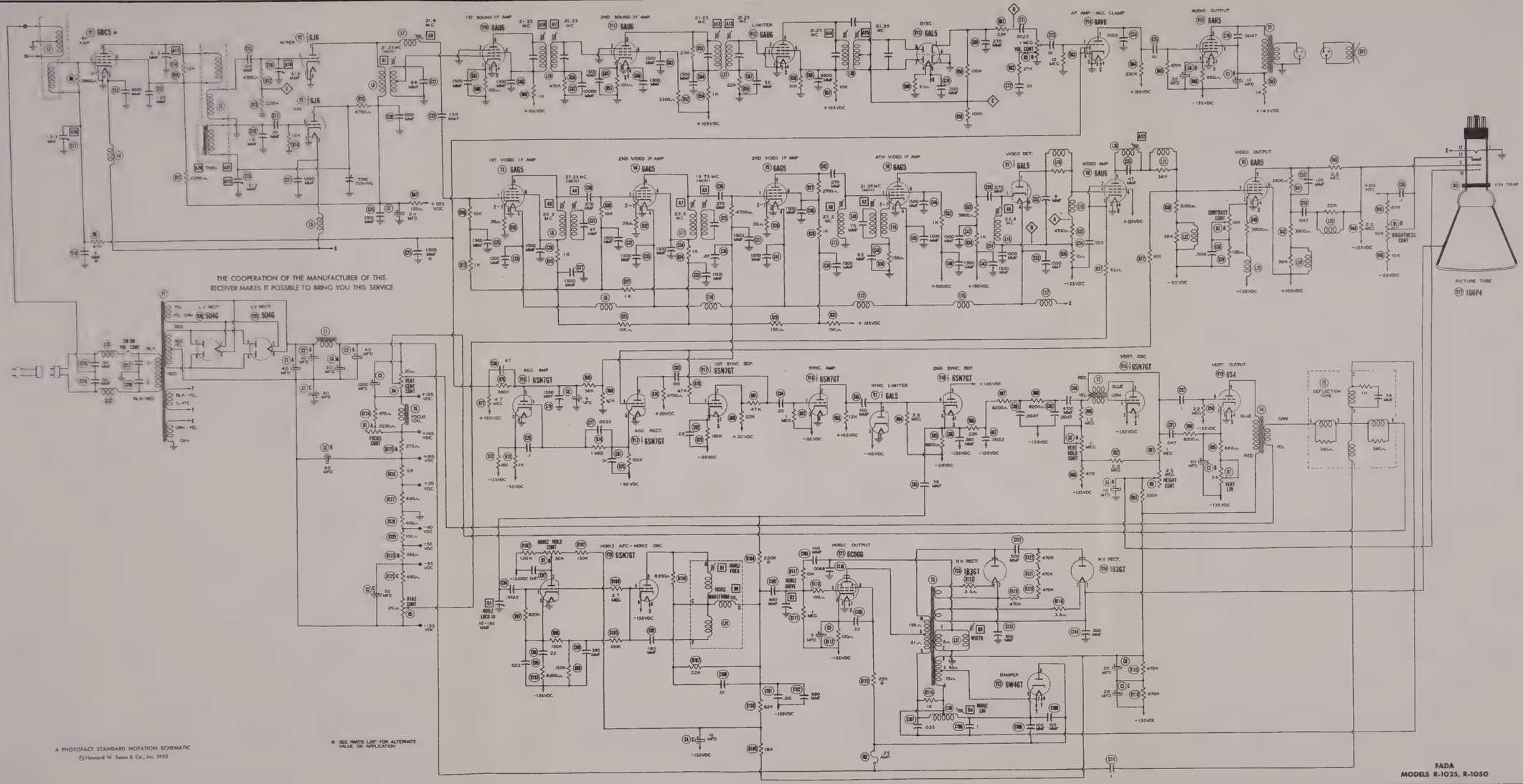
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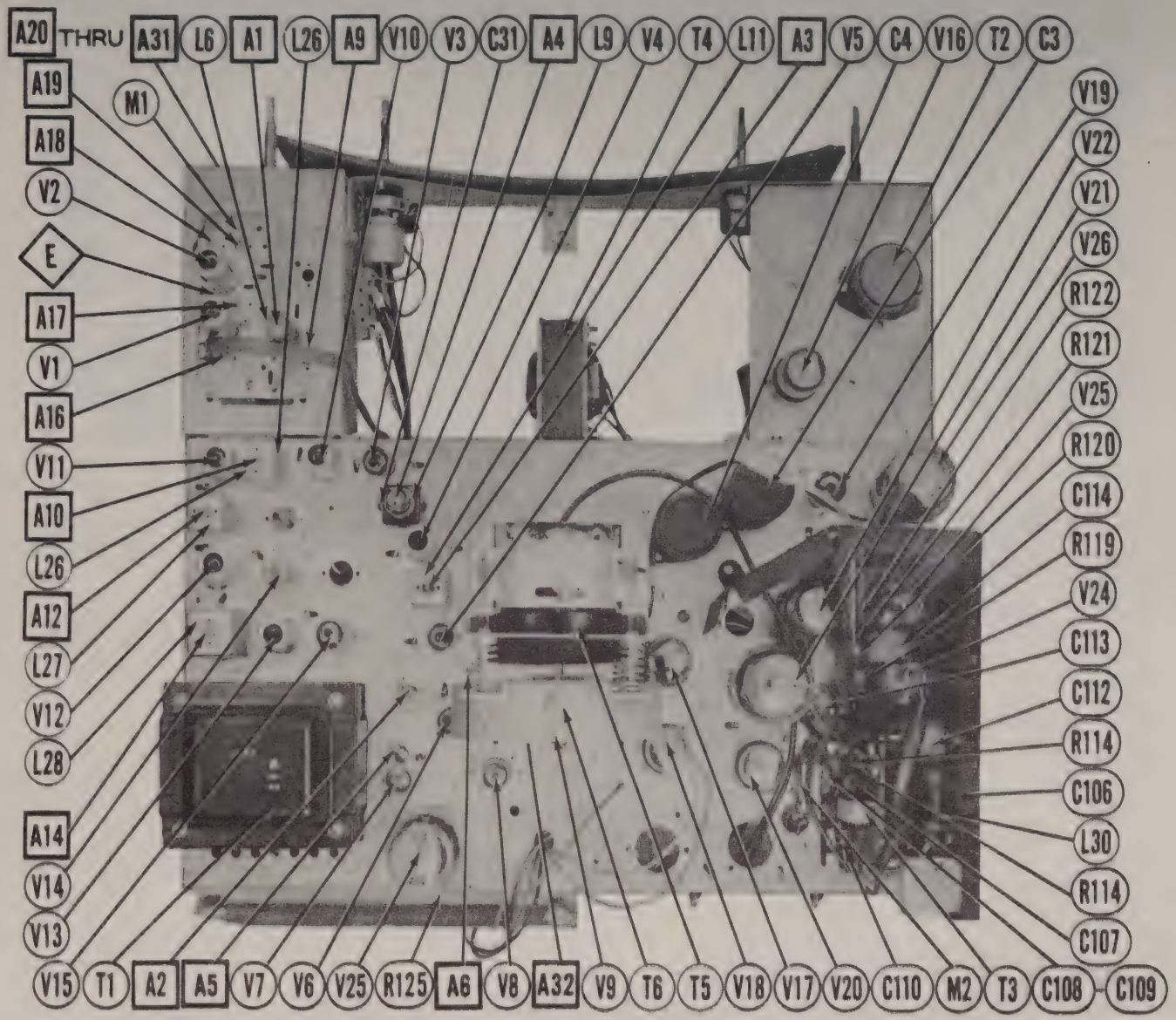
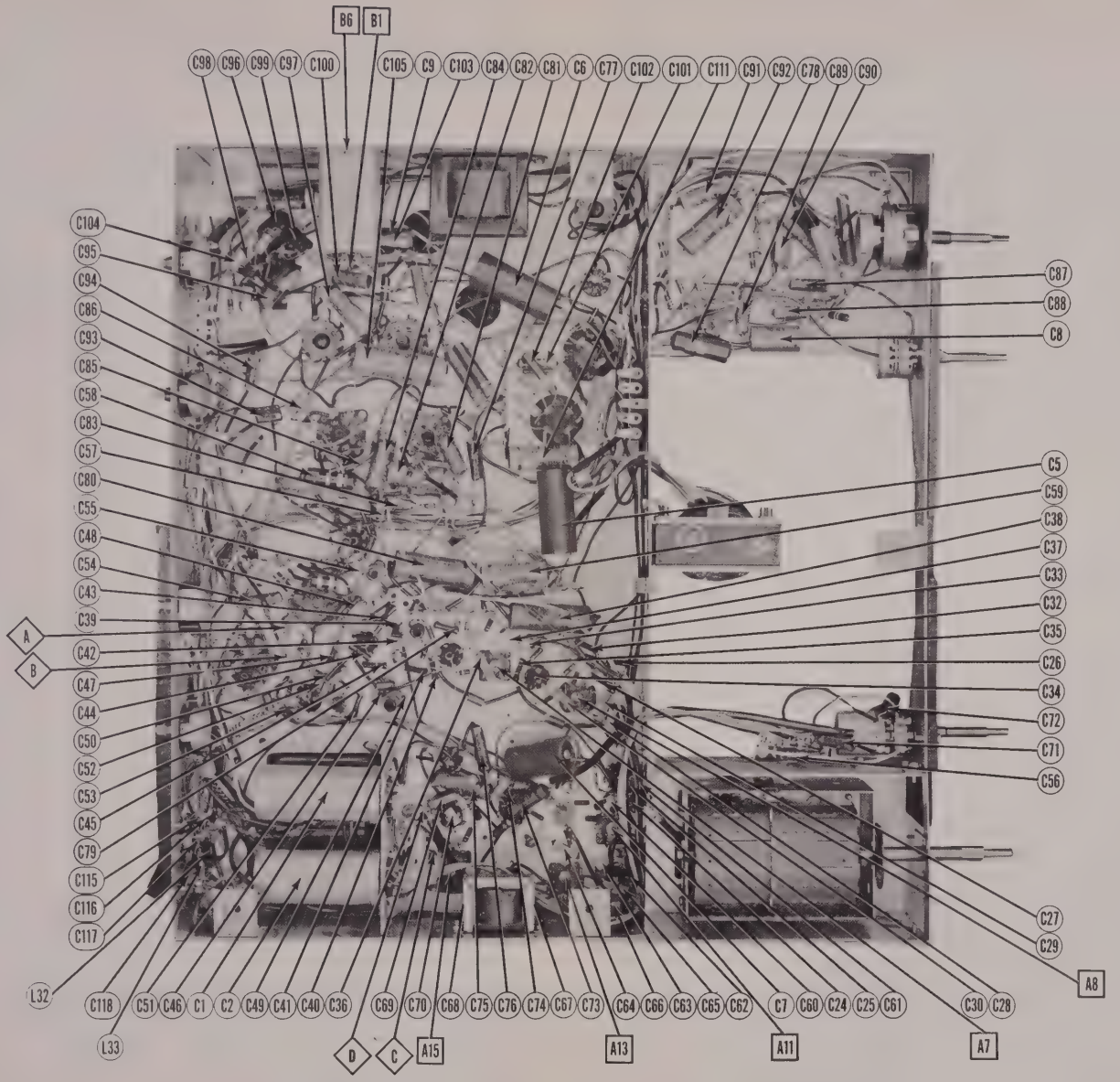
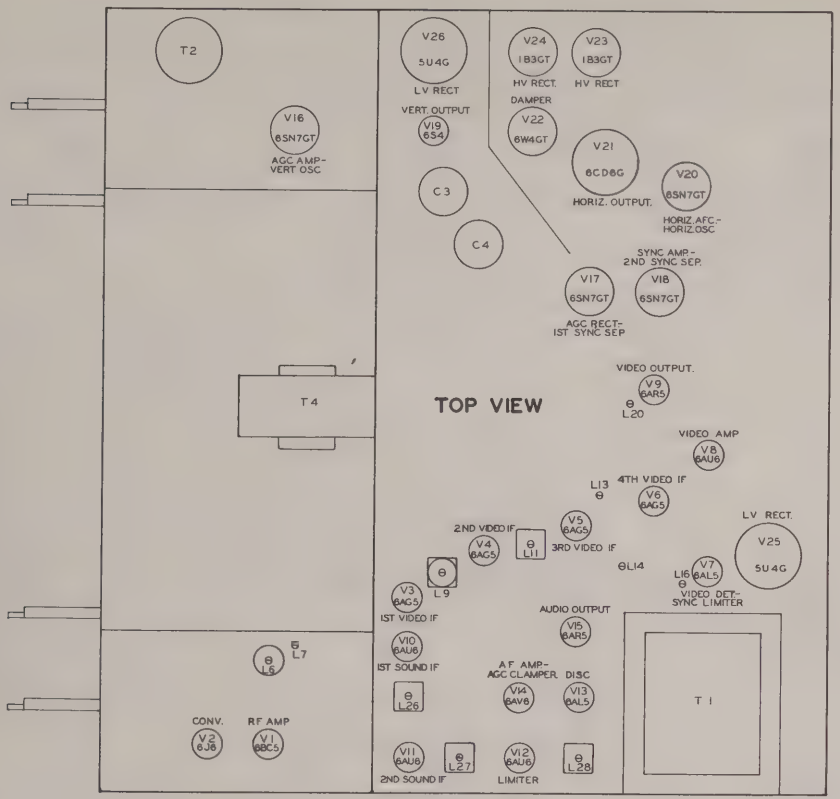
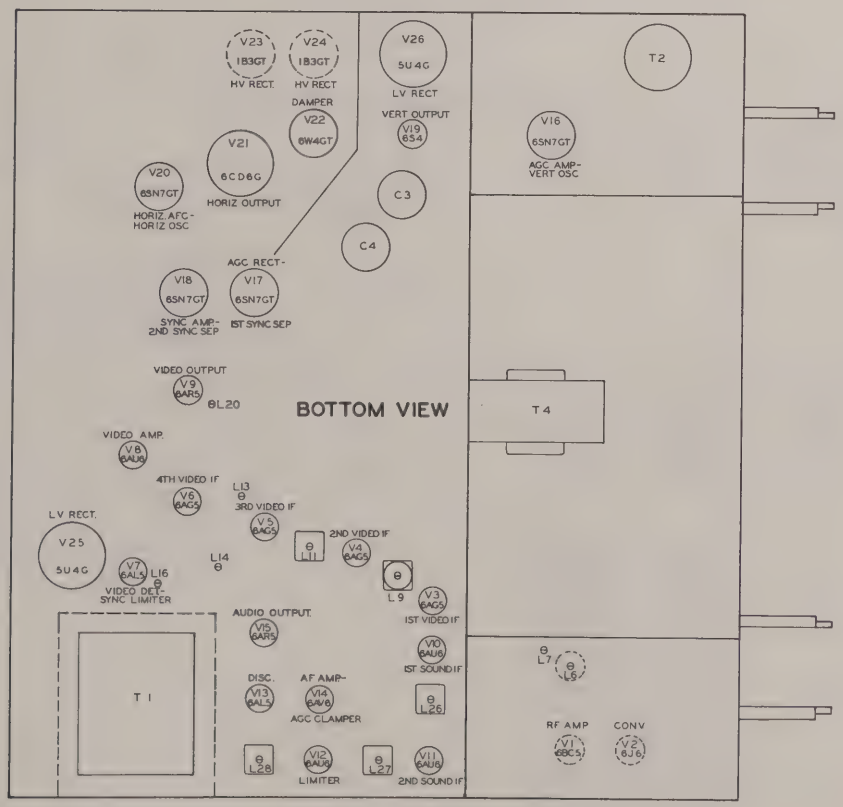


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW–CAPACITOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To eliminate the high voltage shock hazard remove the horizontal output tube (V21) from its socket.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replaced with a 6J6 with pin 1 removed to prevent erroneous indications.
Connect the negative terminal of a 3 volt battery to the junction of R68 and R69 and positive terminal to chassis.
It should be noted that the common lead of the VTVM is at approximately 120 volts potential with respect to chassis, avoid touching or grounding the VTVM case.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	21.25MC (Unmod.)	Any	DC Probe to Point (A). Common to Point (B).	A1, A2	Adjust for MINIMUM deflection.
2.	Direct	"	19.75MC	"	"	A3	"
3.	Direct	"	27.25MC	"	"	A4	"
4.	Direct	"	23.4MC	"	"	A5	Adjust for maximum deflection. Attenuate signal generator to maintain a maximum -2 volts reading.
5.	Direct	"	25.2MC	"	"	A6	"
6.	Direct	"	22.3MC	"	"	A7	"
7.	Direct	"	25.3MC	"	"	A8	"
8.	Direct	"	21.8MC	"	"	A9	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Direct	High side to ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	24MC (10MC SWP)	19.75MC 21.25MC 22.2MC 25MC 25.75MC 26.5MC 27.25MC	Any	Vert. Amp. to Point (A). Low side to chassis.		Check for response curve similar to figure 1. The 25.75MC markers should be at 45% response. If necessary, slightly retouch A5 thru A9 for proper response. If set is to be used in the fringe area, retouch A5 thru A9 for response curve similar to figure 2.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	Direct	High side to ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	21.25MC (Unmod.)	Any	DC Probe thru 10KΩ to pin 1 (Grid) of 6AU6 (V12). Common to chassis.	A10, A11, A12, A13	Adjust for maximum deflection.
11.	Direct	"	"	"	DC Probe thru 10KΩ to Point (C). Common to chassis.	A14	"
12.	Direct	"	"	"	DC Probe to Point (D). Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Direct	High side to ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	21.25MC (450KC SWP)	21.25MC	Any	Vert. Amp. thru 10KΩ to pin 1 (Grid) of 6AU6 (V12). Low side to chassis.	A10, A11, A12, A13	Adjust for maximum amplitude and symmetry as per figure 3.
11.	Direct	"	"	"	"	Vert. Amp. to Point (D). Low side to chassis.	A14, A15	Adjust A15 to place 21.25MC marker at center of diagonal line as per figure 4. Adjust A14 for maximum amplitude and straightness of diagonal line. Continue with step 13.

RF AND MIXER ALIGNMENT

The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	207MC (10MC SWP)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to Point (E). Low side to chassis.	A16, A17, A18	Adjust for flat topped response curve as per figure 5 with markers appearing not less than 70% of maximum amplitude of curve.
14.	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	"		Check response on all channels. A16, A17, and A18 may be adjusted to obtain optimum response on all channels.
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
			85MC (10MC SWP)	83.25MC 87.75MC	6			
			79MC (10MC SWP)	77.25MC 81.75MC	5			
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			

ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT

Remove dummy converter tube and replace original 6J6 in its socket.

Complete alignment of the oscillator circuit may not be necessary. This is determined by checking to see that a zero reading is obtained for each channel when the fine tuning control is tuned through the mid-point of its range. (Connect signal generator and VTVM as in steps 15 and 16. Sound carrier frequencies are listed in step 16). If the majority of the channels seem to need oscillator alignment, this sometimes may be done in one operation-step 12- by adjusting A19. It should be noted that this is an all channel adjustment and should not be adjusted for any individual channels. If step 16 fails to align the oscillator circuits sufficiently, it will be necessary to adjust the oscillator coil slugs. These are accessible one channel at a time through a hole to the right of the channel switch shaft.

The signal generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
15.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	209. 75MC	12	DC Probe to Point ◇. Common to chassis.	A19	Adjust for zero reading between positive and negative peaks with fine tuning control at its mid-point. Rotate channel selector switch and adjust individual channels outlined in step 16. Then repeat step 15.
16.	"	"	215.75MC	13	"	A20	"
			209.75MC	12		A21	
			203.75MC	11		A22	
			197.75MC	10		A23	
			191.75MC	9		A24	
			185.75MC	8		A25	
			179.75MC	7		A26	
			87.75MC	6		A27	
			81.75MC	5		A28	
			71.75MC	4		A29	
			65.75MC	3		A30	
			59.75MC	2		A31	

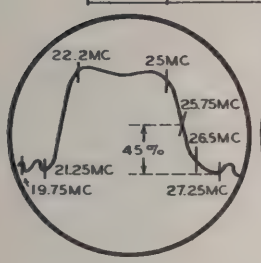


FIG.1

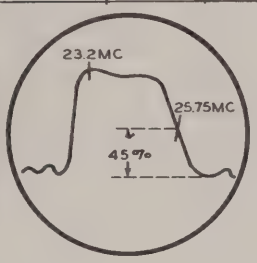


FIG.2

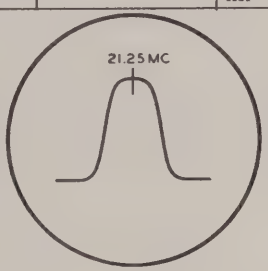


FIG. 3

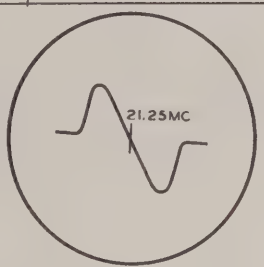


FIG.4

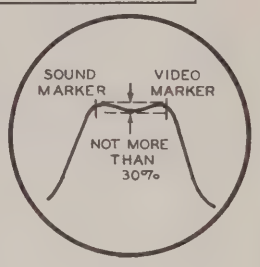


FIG.5

4.5 MC TRAP ADJUSTMENT

Turn set on and tune in a TV station preferably a test pattern. Connect a short across the windings of L21. If a 4.5MC beat appears in the picture, adjust A32 until the beat is eliminated.

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	-.3VDC	0V	6.3VAC	0V	75VDC	75VDC	0V		
V 2	6J6	65VDC	95VDC	6.3VAC	0V	-.7VDC	§-4.8VDC	0V		
V 3	6AG5	-.6VDC	.4CDC	0V	6.3VAC	130VDC	130VDC	.4VDC		
V 4	6AG5	-.4VDC	.4VDC	0V	6.3VAC	130VDC	130VDC	.4VDC		
V 5	§AG5	-.3VDC	.4VDC	0V	6.3VAC	65VDC	90VDC	.4VDC		
V 6	6AG5	0V	1.5VDC	0V	6.3VAC	155VDC	100VDC	1.5VDC		
V 7	6AL5	-140VDC	-75VDC	0V	6.3VAC	-40VDC	0V	-135VDC		
V 8	6AU6	-135VDC	-135VDC -130VDC	0V	6.3VAC	-70VDC	20VDC	-135VDC -130VDC		
V 9	6AR5	-70VDC	-65VDC	0V	6.3VAC	-20VDC	95VDC	0V		
V 10	6AU6	0V	0V	0V	6.3VAC	90VDC	90VDC	.9VDC		
V 11	6AU6	0V	0V	0V	6.3VAC	90VDC	90VDC	.9VDC		
V 12	6AU6	-.4VDC	0V	0V	6.3VAC	40VDC	40VDC	0V		
V 13	6AL5	-.1VDC	-.3VDC	6.3VAC	1.2VAC	0V	0V	.3VDC		
V 14	6AV6	-.4VDC	0V	0V	6.3VAC	-.2VDC	-.2VDC	85VDC		
V 15	6AR5	-125VDC	-115VDC	6.3VAC	0V	105VDC	115VDC	0V		
V 16	6SN7GT	-35VDC	45VDC -35VDC	-135VDC	-50VDC	-.2VDC	-60VDC	6.3VAC	0V	
V 17	6SN7GT	-70VDC	15VDC	-65VDC	75VDC	20VDC	-65VDC	6.3VAC	0V	
V 18	6SN7GT	-55VDC	50VDC	-55VDC	-75VDC	145VDC	-50VDC	6.3VAC	0V	
V 19	6S4	0V	-125VDC -100VDC	-140VDC -100VDC	6.3VAC	0V	-140VDC -100VDC	0V	0V	300VDC
V 20	6SN7GT	-125VDC	-3.6VDC	-145VDC	-185VDC	110VDC	-140VDC	0V	6.3VAC	
V 21	6CD6G	0V	0V	-125VDC	100VDC	-140VDC	-135VDC	6.3VAC	-15VDC	TOP CAP *
V 22	6W4GT	0V	0V	320VDC	0V	195VDC	0V	¶310VDC	¶310VDC	
V 23	1B3GT	* DO NOT MEASURE								
V 24	1B3GT	* DO NOT MEASURE								
V 25	5U4G	0V	210VDC	0V	200VAC	0V	200VAC	0V	210VDC	
V 26	5U4G	0V	210VDC	0V	200VAC	0V	200VAC	0V	210VDC	
V 27	16GP4	0V	-43VDC	PIN 10 235VDC	PIN 11 40VDC	PIN 12 6.3VAC				

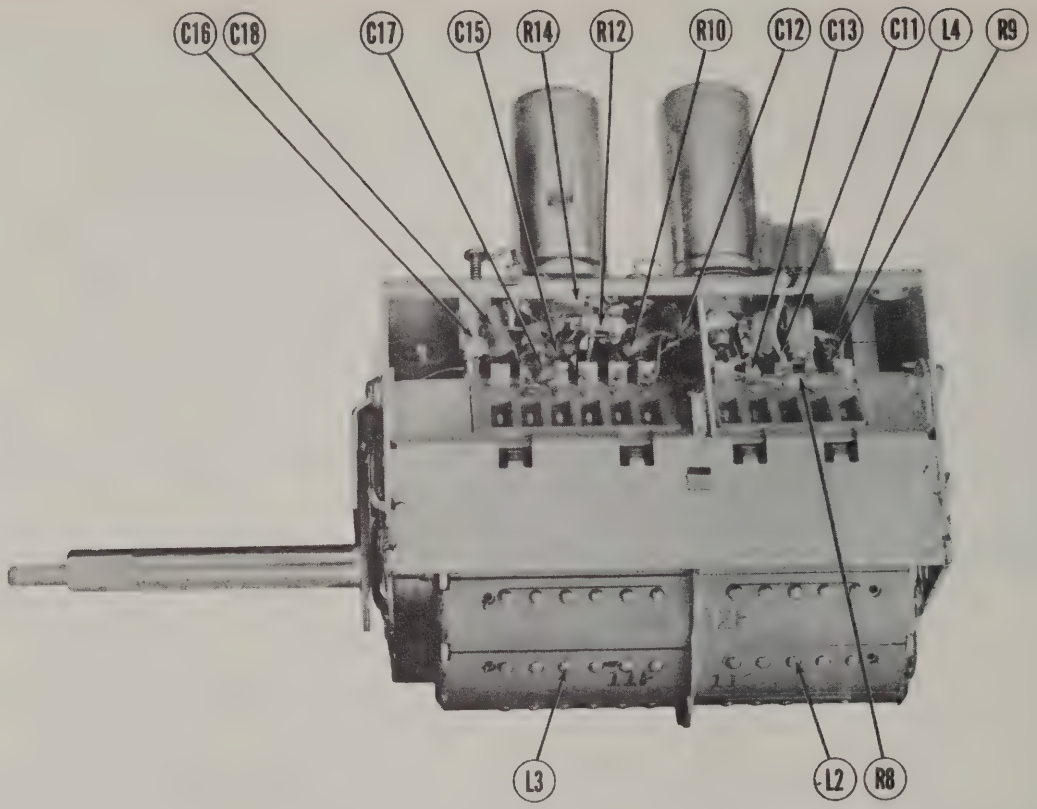
§ TAKEN WITH VACUUM TUBE VOLTMETER
* DO NOT MEASURE
¶ 6.3VAC MEASURED ACROSS FILAMENTS

RESISTANCE READINGS

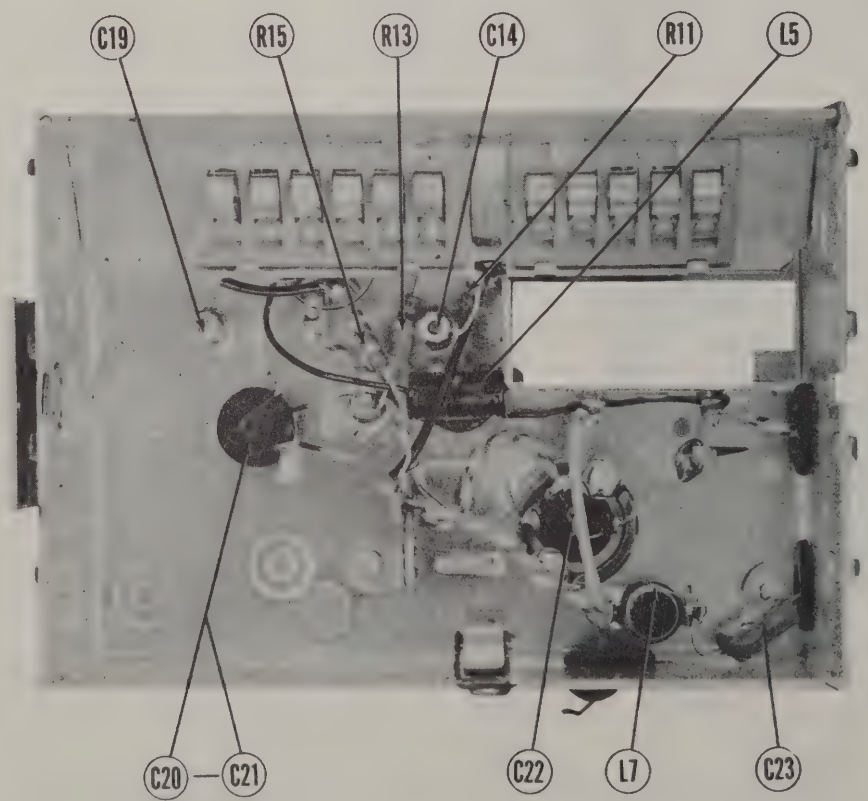
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	450KΩ	0Ω	.1Ω	0Ω	†3.1KΩ	†3.1KΩ	0Ω		
V 2	6J6	†5.6KΩ	†950Ω	.1Ω	0Ω	225KΩ	10KΩ	0Ω		
V 3	6AG5	24KΩ	39Ω	0Ω	.1Ω	†2.3KΩ	†2.3KΩ	39Ω		
V 4	6AG5	23KΩ	39Ω	0Ω	.1Ω	†2.3KΩ	†2.3KΩ	39Ω		
V 5	6AG5	17KΩ	39Ω	0Ω	.1Ω	†4.7KΩ	†2KΩ	39Ω		
V 6	6AG5	.3Ω	150Ω	0Ω	.1Ω	†6.8KΩ	†1.9KΩ	150Ω		
V 7	6AL5	1.3KΩ	3.9 Meg.	0Ω	.1Ω	400Ω	0Ω	6KΩ		
V 8	6AU6	6KΩ	1.4KΩ	0Ω	.1Ω	5.6KΩ	†3.5KΩ	1.4KΩ		
V 9	6AR5	5.6KΩ	3.4KΩ	0Ω	.1Ω	†9KΩ	†800Ω	Inf.		
V 10	6AU6	0Ω	0Ω	0Ω	.1Ω	†1.8KΩ	†1.8KΩ	100Ω		
V 11	6AU6	470KΩ	0Ω	0Ω	.1Ω	†1.8KΩ	†4KΩ	100Ω		
V 12	6AU6	22KΩ	0Ω	0Ω	.1Ω	†6.5KΩ	†6.5KΩ	0Ω		
V 13	6AL5	200KΩ	100KΩ	.1Ω	4Ω	0Ω	0Ω	100KΩ		
V 14	6AV6	10 Meg.	0Ω	0Ω	.1Ω	400KΩ	400KΩ	†330KΩ		
V 15	6AR5	470KΩ	2KΩ	.1Ω	0Ω	†1.8KΩ	†1.4KΩ	Inf.		
V 16	6SN7GT	2.5 Meg.	▲1.2 Meg. ▲2.2 Meg.	1.3KΩ	1.1 Meg.	†70KΩ	1.5KΩ	.1Ω	0Ω	
V 17	6SN7GT	62KΩ	†26KΩ	180KΩ	15KΩ	†8.5KΩ	100KΩ	.1Ω	0Ω	
V 18	6SN7GT	1 Meg.	†12KΩ	500Ω	3.9 Meg.	†330Ω	7.3KΩ	.1Ω	0Ω	
V 19	6S4	Inf.	7KΩ 2KΩ	2.2 Meg.	.1Ω	0Ω	2.2 Meg.	Inf.	Inf.	▲600Ω
V 20	6SN7GT	800KΩ	▲170KΩ	300KΩ	250KΩ	▲115KΩ	1.3KΩ	0Ω	.1Ω	
V 21	6CD6G	Inf.	0Ω	1.4KΩ	▲270KΩ	1 Meg.	1.3KΩ	.1Ω	†23KΩ	TOP CAP ▲57Ω
V 22	6W4GT	Inf.	Inf.	180KΩ	Inf.	†70Ω	Inf.	▲12Ω	▲12Ω	
V 23	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP ▲215Ω
V 24	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP Inf.
V 25	5U4G	Inf.	4.6KΩ	Inf.	1.3KΩ	Inf.	1.3KΩ	Inf.	4.6KΩ	
V 26	5U4G	Inf.	4.6KΩ	Inf.	1.3KΩ	Inf.	1.3KΩ	Inf.	4.6KΩ	
V 27	16GP4	0Ω	1.1 Meg.	PIN 10 ▲250KΩ	PIN 11 27KΩ	PIN 12 .1Ω				

† MEASURED FROM PIN 8 OF V26
▲ MEASURED FROM PIN 3 OF V22

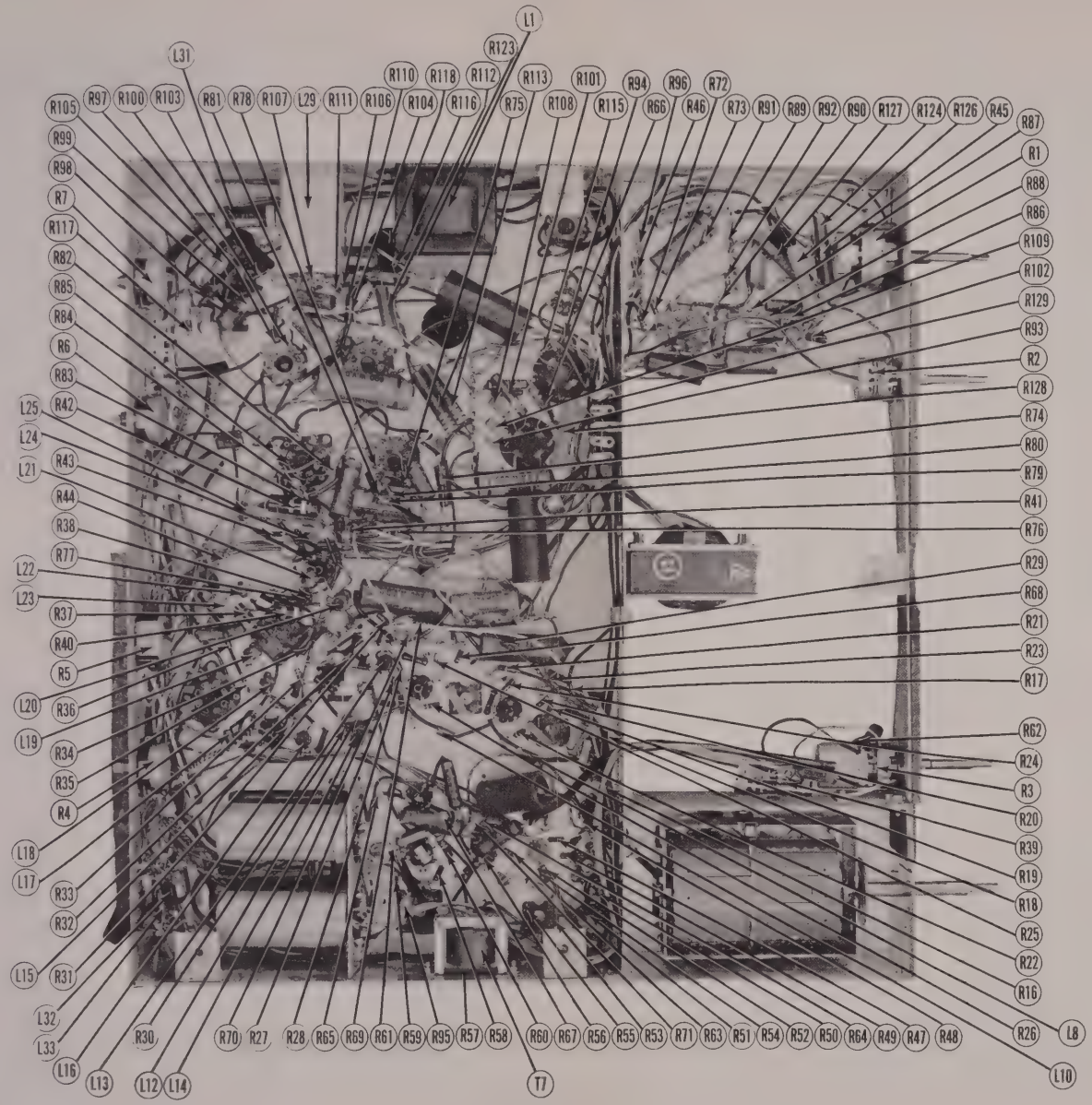
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

HORIZONTAL FREQUENCY ADJUSTMENT

Connect a jumper across terminals "C" and "D" of the horizontal oscillator transformer L29. Tune in a station and, if possible, sync the picture and proceed as follows:

1. Turn horizontal hold control fully clockwise. Adjust the Frequency Adjustment (B1) so picture is just out of sync and the horizontal blanking appears as a vertical bar.

2. Turn the hold control approximately a quarter of a turn from the fully clockwise position and notice the picture width and linearity. If the width and linearity is incorrect, adjust the horizontal drive (B2), width (B3) and horizontal linearity (B4) controls until the picture is correct. If B2, B3 and B4 required adjustment repeat step 1 above.

HORIZONTAL LOCKING RANGE ADJUSTMENT

Turn the horizontal hold control fully counterclockwise. Remove signal momentarily by turning channel switch to another channel and back again. Slowly turn the hold control clockwise and note the number of diagonal bars that appear just before the picture "syncs".

If more than 9 bars are present just before synchronization, turn the horizontal locking range trimmer (B5) slightly clockwise. If less than 7 bars are present, turn B5 slightly counterclockwise.

Turn the hold control counterclockwise and momentarily interrupt the signal and check the number of bars present at the pull-in point. Repeat this procedure until 7 to 9 bars are present.

HORIZONTAL OSCILLATOR WAVEFORM ADJUSTMENT

Remove the jumper across terminals "C" and "D" of L29.

Turn the horizontal hold control fully clockwise. Adjust B6 with a non-metallic screwdriver until the horizontal blanking bar is present on the raster.

Connect the low capacity probe of an oscilloscope to terminal "C" of L29. Turn the horizontal hold control one quarter of a turn from the clockwise position until the picture "syncs". The pattern on the scope should be similar to figure 6. Adjust B6 until the broad and narrow peaks are of the same amplitude (If necessary, while making this adjustment turn the hold control to keep the picture in synchronization).

This adjustment must be carefully made to assure correct circuit operation. If the broad peak is lower in amplitude than the sharp peak, the oscillator drift becomes greater and the circuit has great susceptibility to noise pluses. However, if the broad peak is greater in amplitude than the sharp peak, the oscillator is overstabilized, the pull-in range inadequate, and there is the possibility of double triggering of the oscillator as the horizontal hold control approaches the extreme clockwise position.

HORIZONTAL OSCILLATOR ADJUSTMENTS CHECK

Turn the horizontal hold control fully counterclockwise. Momentarily remove the signal and then slowly turn the hold control clockwise and note the number of bars present just before the picture synchronizes.

If more than 3 bars are present, turn B5 slightly clockwise. If less than 3 bars are present, turn B5 slightly counterclockwise. Momentarily remove the signal and recheck the number of bars present at the pull-in point. Repeat this procedure until 3 bars are present just before synchronization occurs.

Turn the horizontal hold control fully clockwise. The picture should be just out of synchronization to the extent that the horizontal blanking bar appears as a single vertical or diagonal bar in the picture. Retouch B1 until this condition exists.

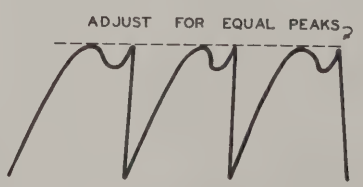


FIG. 6

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		FADA PART No.	STANDARD REPLACEMENT		
V1A	RF Amp.	6BC5	6BC5	7BD	
B	RF Amp.	6AG5	6AG5	7BD	
V2	Converter	6J6	6J6	7BF	
V3	1st Video IF	6AG5	6AG5	7BD	
V4	2nd Video IF	6AG5	6AG5	7BD	
V5	3rd Video IF	6AG5	6AG5	7BD	
V6	4th Video IF	6AG5	6AG5	7BD	
V7	Video Det. -Sync. Limiter	6AL5	6AL5	6BT	
V8	Video Amp.	6AU6	6AU6	7BK	
V9	Video Output	6AR5	6AR5	6CC	
V10	1st Sound IF	6AU6	6AU6	7BK	
V11	2nd Sound IF	6AU6	6AU6	7BK	
V12	Limiter	6AU6	6AU6	7BK	
V13	Discr.	6AL5	6AL5	6BT	
V14	AF Amp. -AGC Clamp	6AV6	6AV6	7BT	
V15	Audio Output	6AR5	6AR5	6CC	
V16	AGC Amp. -Vert. Osc.	6SN7	6SN7	8BD	
V17	AGC Rect. -1st Sync. Sep.	6SN7	6SN7	8BD	
V18	Sync. Amp. -2nd Sync. Sep.	6SN7	6SN7	8BD	
V19	Vert. Output	6S4	6S4	9AC	
V20	Hor. AFC-Hor. Osc.	6SN7	6SN7	8BD	
V21	Hor. Output	6BD6G	6BD6G	5BT	
V22	Damper	6W4GT	6W4GT	4CG	
V23	HV Rect.	1B3GT	1B3GT	3C	
V24	HV Rect.	1B3GT	1B3GT	3C	
V25	LV Rect.	5U4G	5U4G	5T	
V26	LV Rect.	5U4G	5U4G	5T	
V27	Picture Tube	16GP4	16GP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	FADA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	40	450		AFH82J16E		UPT4145-820		TVL-3761	▲ Filter
B	10	450							■ Output Decoupling
C	80	200							▲ Filter
C2A	40	450		AFH8J1810D		UPT445-9515		TVL-3708	◓ Filter
B	90	150							■ Vert. Output Cath.
C	50	150							▲ Filter
C3A	40	450		AF884J		UPT44145			◓ Filter
B	40	450							■ Filter
C	20	450							▲ Filter
C4A	60	450		AF1222J4D		UP61145-215		TVL-4753	◓ Filter
B	10	450							■ Decoupling
C	10	450							▲ Decoupling
D	20	150							Output Cathode
C5	1000	6		PRS6/1000		BRH610		TVA-1104	Vert. Cent. Cont. Byp.
C6	20	450		PRS450/20		BR2045A		TVA-1709	Filter
C7	24	300		PRS350/24		BR2435		TVA-1608	Decoupling
C8	5	50		PRS150/4		BR550		TVA-1303	AGC Filter
C9	5	50		PRS150/4		BR550		TVA-1303	Hor. Output Cath.
C10	5			SI5NPO	TCZ-4.7		NPOK-5		Fixed Trimmer *
C11	.5-3				829-3				Variable Trimmer
C12	120			SI120	D6-121		GP2K-120	19C29	RF Decoupling
C13	1000			SI1000	D6-102		GP2L-001	19C1	RF Fil. Bypass
C14	.5-3				829-3				Variable Trimmer
C15	100			SI100	D6-101		GP1K-100	19C11	RF Coupling
C16	.5-3				829-3				Variable Trimmer
C17	20			SI20NPO	TCZ-20		NPOK-20		Osc. Grid Cap.
C18	10			SI10N750	TCN-10		N750K-10	19C4	Fixed Trimmer
C19	.5-3				829-3				Variable Trimmer
C20	1000			SI1000	D6-102		GP2L-001	19C1	RF Bypass
C21	1000			SI1000	D6-102		GP2L-001	19C1	Conv. Fil. Bypass
C22	68	500			TCZ-68		NPOM-68	36C9	Fixed Trimmer
C23	120	500		SI120	D6-121		GP2K-120	19C29	IF Coupling
C24	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	RF Bypass
C25	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	AGC Filter *
C26	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	AGC Filter
C27	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	RF Bypass
C28	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	1st V. IF Dec.
C29	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	1st V. IF Fil.
C30	270	500		1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	IF Coupling
C31	47				TCZ-47		NPOM-47	29C14	Fixed Trimmer
C32	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	AGC Filter
C33	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	RF Bypass
C34	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	2nd V. IF Dec.
C35	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	2nd V. IF Fil.
C36	270	500		1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	IF Coupling
C37	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	AGC Filter
C38	.47	200		P288-47		GT2P25		2TM-P25	AGC Filter
C39	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	RF Bypass
C40	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	3rd V. IF Dec.
C41	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	3rd V. IF Fil.
C42	270	500		1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	IF Coupling
C43	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	RF Bypass
C44	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	4th V. IF Screen
C45	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	4th V. IF Fil.
C46	82	500		1468-0001	TCZ-82	5W5T1	GP1K-82	1FM-31	4th V. IF Cath.
C47	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	4th V. IF Plate Dec.
C48	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	RF Bypass
C49	75			SI75NPO	TCZ-75		NPOM-75		Fixed Trimmer
C50	270	500		1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	IF Coupling

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA FADA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C51	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	RF Bypass
C52	6			SI6 8NPO	TCZ-6 8	5W5V5	NPOK-6.8	MS-55	V. Diode Filter
C53	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	V. Det.-Limiter Fil.
C54	.005	600		P688-005	D6-152	PTE6D5	811-005	6TM-D5	1st V. Amp. Cath.
C55	47			SL50NPO	TCZ-47	SR5Q5	NPOM-50	29C14	Fixed Trimmer
C56	.004	600		P688-004	D6-403	PTE6D4	GP3M-004	6TM-D4	2nd V. Amp. Cath.
C57	120			SI120	D6-121	5W5T15	GP2K-120	19C39	Peaking
C58	.047	400		P488-047	DF-503	PTE4S5		4TM-S47	Video Coupling
C59	.1	400		P488-1	DF-104	PTE4P1		4TM-P1	Pic. Tube Cath.
C60	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	1st S. IF Dec.
C61	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	1st S. IF Cath.
C62	10000			BPD-01	DD-103	PTE4S1	811-01	36C1	2nd S. IF Grid
C63	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	2nd S. IF Screen
C64	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	2nd S. IF Plate Dec.
C65	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	2nd S. IF Cath.
C66	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	2nd S. IF Fil.
C67	50			SI50	D6-500	5W5Q5	GP1K-50	19C28	Limiter Grid Filter
C68	6800			SI6800	D6-682	PTE6D6	811-01	6TM-D68	Limiter Decoup.
C69	270	500		1468-00085	D6-271	5W5T15	GP2K-270	1FM-325	RF Bypass
C70	500			SI500	D6-501	5W5T5	GP2K-500	19C32	Discr. Fil.
C71	.0022	600		P688-0022	D6-222	PTE6D2	GP3M-0022	6TM-D22	Audio Coupling
C72	.01	400		P488-01	D6-103	PTE4S1	811-01	4TM-S1	Tone Comp.
C73	.01	600		P688-01	D6-103	PTE6S1	811-01	6TM-S1	Audio Coupling
C74	.0022	600		P688-0022	D6-222	PTE6D2	GP3M-0022	6TM-D22	De-emphasis
C75	.01	1000		P1068-01	D6-103	PTE16S1	811-01	MB-S1	Audio Coupling
C76	.0047	600		P688-0047	D6-472	PTE6D5	GP3M-0047	6TM-D47	Output Plate
C77	.0033	600		P688-0033	D6-332	PTE6D3	GP3M-0033	6TM-D3	AGC Coupling
C78	.1	400		P488-1	DF-104	PTE4P1		4TM-P1	AGC Amp. Grid
C79	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	AGC Filter
C80	.47	200		P288-47	-	GT2P5		2TM-P25	AGC Filter
C81	.01	400		P488-01	D6-103	PTE4S1	811-01	4TM-S1	Sync. Sep. Cath.
C82	.22	200		P488-22		GT2P25		2TM-P22	Sync. Sep. Cathode
C83	.001	600		P688-001	D6-102	PTE6D1	GP2L-001	6TM-D1	Sync. Coupling
C84	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	Sync. Coupling
C85	100	500		1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	Sync. Coupling
C86	390	500		1468-0004	D6-391	5W5T4	GP2K-390	1FM-34	2nd Sync. Sep. Cath.
C87	.0022	600		P688-0022	D6-222	PTE6D2	GP3M-0022	6TM-D22	Integrator Net.
C88	.0047	600		P688-0047	D6-472	PTE6D5	GP3M-0047	6TM-D47	Integrator Net.
C89	.0047	600		P688-0047	D6-472	PTE6D5	GP3M-0047	6TM-D47	Integrator Net.
C90	4700	500		1467-005	D6-472	1D5D5	GP2M-0047	1FM-25	Vert. Sync. Coup.
C91	.047	600		P688-047		PTE6S5		6TM-S47	Vert. Discharge
C92	.1	600		P688-1	DF-104	PTE6P1		6TM-P1	Vert. Sweep Coupling
C93	56	500		1469-00005	TCZ-56	5R5Q5	NPOM-56	MS-45	Hor. Sync. Coupling
C94	.0022	600		P688-0022	D6-222	PTE6D2	GP2M-0022	6TM-D22	Hor. Sync. Coupling
C95	.022	400		P488-022	DF-203	PTE4S2		4TM-S22	AFC Filter
C96	.22	400		P488-22		GT4P25		4TM-P22	AFC Filter
C97	.047	600		P688-047	DF-503	PTE6S5		6TM-S47	Hor. AFC Plate
C98	390	500		1468-0004	D6-391	5W5T4	GP2K-390	1FM-34	Bias Filter
C99	180	1000							Hor. Osc. Grid
C100	.01	600		P688-01		PTE6S1		6TM-S1	Fixed Trimmer
C101	.001	600		P688-001	D6-102	PTE6D1	GP2L-001	6TM-D1	Hor. Discharge
C102	680	1000		SI680	D6-680	1W5T7	GP2K-680	MS-37	Hor. Discharge
C103	680	1000							Hor. Sweep Coupling
C104	100	2500							Hor. Feedback
C105	.22	600		684-25		GT6P25		6TM-P25	Hor. Output Screen
C106	.1	400		P488-1		PTE4P1		4TM-P1	Damper Filter
C107	.035	600		P688-033					Damper Filter
C108	100	2500							Damper Plate Byp.
C109	100	2500							Damper Plate Byp.
C110	.0068	600		P688-0068		PTE16D7		6TM-D6f	Fixed Trimmer
C111	.1	600		P688-1	DF-104	PTE6P1		6TM-P1	Hor. Sweep Coupling
C112	500	10000		HV10B	TV1-501				Voltage Doubler Cap.
C113	500	10000		HV10B	TV2-501				HV Filter
C114	500	20000		HV20C	TV2-502				HV Filter
C115	50			SI50	D6-500	5W5Q1	GP1K-50	19C28	Line Ant. Coupling
C116	50			SI50	D6-500	5W5Q1	GP1K-50	19C28	Line Ant. Coupling
C117	.01	400		P488-01	D6-103	PTE4S1	811-01	4TM-S1	Line Filter
C118	.01	400		P488-01	D6-103	PTE4S1	811-01	4TM-S1	Line Filter

* Not used in all models.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA FADA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	2250Ω	4	52. 62		RTV-111		Focus control-Wire Wound-front
B	50KΩ	1					Brightness control-rear
				Concentrikit*			
R2A	1 Meg.	1		B11-137 *			Vert. hold control-front
B	50KΩ	1	52. 66	B11-123 *	RTV-110	SBB-510	Horiz. hold control-rear
C	Shaft End			E-187 *			Attach per instr. in "Concentrikit".
				Concentrikit*			
R3A	10KΩ	1		B17-116 *			Contrast control-front
B	1 Meg.	1		B13-137X *			Volume control-rear-tapped at 250KΩ
C	Shaft End		52. 67	E-187 *	RTV-207	SBB-535-S	Attach per instr. in "Concentrikit"
D	Switch			76-1 *			Attach per instr. in "Concentrikit"
R4	20Ω	2	52. 26	W-20 x 10	RTV-3	SVT-901	Vert. centering control-Wire Wound
R5	20Ω	2	52. 52	W-20	RTV-4	VK-110	Bias control-Wire Wound
R6A	2. 5 Meg.	1	52. 24	Q11-239	AM-84-S	AN-83	Height control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R6A per instructions
R7	5000Ω	2	52 68	W-5000	43-5000	VK-135	Vert. linearity control-Wire Wound

* Additional parts to be used with "Concentrikit".

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA FADA PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R8	3900Ω	1		BTS-3900	Antenna Coil Shunt
R9	47KΩ 20%	1		BTS-47K	AGC Network
R10	10KΩ	1		BTS-10K	RF Amp. Plate Coil Shunt
R11	2200Ω 20%	1		BTS-2200	RF Amp. Decoupling
R12	4700Ω	1		BTS-4700	Conv. Grid
R13	220KΩ 20%	1		BTS-220K	Conv. Grid
R14	10KΩ	1		BTS-10K	Osc. Grid
R15	4700Ω	1		BTS-4700	Osc. Plate
R16	10KΩ 5%	1			1st Video IF Amp. Grid
R17	1000Ω	1		BTS-1000	AGC Network
R18	39Ω	1			1st Video IF Amp. Cathode
R19	1000Ω 20%	1		BTS-1000	1st Video IF Amp. Decoupling
R20	10KΩ 5%	1			2nd Video IF Amp. Grid
R21	1000Ω	1		BTS-1000	AGC Network
R22	39Ω	1			2nd Video IF Amp. Cathode
R23	150Ω 20%	1		BTS-150	Decoupling
R24	1000Ω 20%	1		BTS-1000	2nd Video IF Amp. Decoupling
R25	4700Ω 5%	1		BTS-4700-5%	3rd Video IF Amp. Grid
	39Ω	1			3rd Video IF Amp. Cathode
R27	2700Ω 5%	1		BTS-2700-5%	3rd Video IF Amp. Plate
R28	1000Ω 20%	1		BTS-1000	3rd Video IF Amp. Decoupling
R29	150Ω 20%	1		BTS-150	Decoupling
R30	150Ω	1		BTS-150	4th Video IF Amp. Cathode
R31	150Ω 20%	1		BTS-150	Decoupling
R32	1000Ω	1		BTS-1000	4th Video IF Amp. Screen
R33	5600Ω 5%	1			4th Video IF Amp. Plate
R34	1000Ω 20%	1		BTS-1000	4th Video IF Amp. Plate Decoupling
R35	4700Ω 5%	1		BTS-4700-5%	Video Det. Diode Load
R36	10Ω 20%	1			Bias Network
R37	82Ω	1		BW-1-82	Video Amp. Cathode
R38	5100Ω 5%	1			Video Output Grid
R39	150Ω	1		BTS-150	Video Output Cathode
R40	3900Ω	2		BTB-3900	Bias Network
R41	3900Ω	2		BTB-3900	Video Output Plate
R42	3900Ω	2		BTB-3900	Video Output Plate
R43	2.2 Meg.	1		BTS-2.2 Meg.	Voltage Divider
R44	2.2 Meg.	1		BTS-2.2 Meg.	Picture Tube Grid
R45	47KΩ	1		BTS-47K	Voltage Divider
R46	10KΩ	1		BTS-10K	Voltage Divider
R47	150Ω 20%	1		BTS-150	Decoupling
R48	100Ω	1		BTS-100	1st Sound IF Amp. Cathode
R49	1000Ω 20%	1		BTS-1000	1st Sound IF Amp. Decoupling
R50	470KΩ	1			2nd Sound IF Amp. Grid
R51	100Ω	1		BTS-100	2nd Sound IF Amp. Cathode
R52	3300Ω	1		BTS-3300	2nd Sound IF Amp. Screen
R53	27KΩ	1			2nd Sound IF Transformer Shunt
R54	1000Ω	1		BTS-1000	2nd Sound IF Amp. Plate Decoupling
R55	22KΩ	1			Limiter Grid
R56	10KΩ	1			Voltage Divider
R57	10KΩ	1			Limiter Decoupling
R58	100KΩ	1		BTS-100K	Disc. Diode Load
R59	100KΩ	1		BTS-100K	Disc. Diode Load
R60	5.1Ω	1		BW-½-4.7	Disc. Filament-Wire Wound
R61	22KΩ	1		BTS-22K	De-emphasis
R62	27KΩ	1		BTS-27K	Tone Compensation
R63	10 Meg. 20%	1		BTS-10 Meg.	AF Amp. Grid
R64	330KΩ 20%	1		BTS-330K	AF Amp. Plate
R65	470KΩ	1		BTS-470K	Audio Output Grid
R66	680Ω	1		BTA-680	Audio Output Cathode
R67	1000Ω	2		BTB-1000	Audio Output Decoupling
R68	12KΩ 5%	1		BTS-12K-5%	AGC Network
R69	56KΩ 5%	1		BTS-56K-5%	AGC Network
R70	360KΩ 5%	1		BTS-360K-5%	AGC Network
R71	4. 7 Meg. 5%	1		BTA-4. 7 Meg. 5%	Voltage Divider
R72	18KΩ	1		BTS-18K	Bias Network
R73	1000Ω 20%	1		BTS-1000	Bias Network
R74	1 Meg.	1		BTS-1 Meg.	Voltage Divider
R75	100KΩ	1		BTS-100K	AGC Rect. Cathode
R76	4700Ω	1		BTS-4700	AGC Rect. Plate
R77	10KΩ	1		BTS-10K	Isolation
R78	47KΩ	1		BTS-47K	1st Sync. Sep. Grid
R79	180KΩ	1		BTS-180K	1st Sync. Sep. Cathode
R80	22KΩ	1		BTS-22K	1st Sync. Sep. Plate
R81	47KΩ	1		BTS-47K	Phase Shifting
R82	1 Meg.	1		BTS-1 Meg.	Sync. Amp. Grid
R83	12KΩ	1		BTA-12K	Sync. Amp. Plate
R84	3. 9 Meg.	1		BTS-3. 9 Meg.	Sync. Limiter Diode Load
R85	6800Ω	1		BTS-6800	2nd Sync. Sep. Cathode
R86	22KΩ	1		BTS-22K	Integrator
R87	8200Ω	1		BTS-8200	Integrator
R88	8200Ω	1		BTS-8200	Integrator
R89	1. 5 Meg. 5%	1		BTS-1. 5 Meg. 5%	Vert. Osc. Grid
R90	47KΩ	1		BTS-47K	Voltage Divider
R91	1 Meg.	1		BTS-1 Meg.	Vert. Osc. Plate
R92	2. 2 Meg.	1		BTS-2. 2 Meg.	Voltage Divider
R93	330KΩ 20%	1		BTS-330K	Decoupling
R94	2. 2 Meg.	1		BTS-2. 2 Meg.	Vert. Output Grid
R95	680Ω	1		BTA-680	Vert. Output Cathode
R96	8200Ω	1		BTS-8200	Vert. Peaking
R97	820KΩ 5%	1		BTS-820K-5%	Horiz. AFC Grid
R98	150KΩ	1		BTS-150K	Horiz. AFC Cathode
R99	150KΩ 5%	1		BTA-150K-5%	Horiz. AFC Cathode
R100	2. 7 Meg. 5%	1		BTA-2. 7 Meg. 5%	Voltage Divider
R101	150KΩ	1		BTA-150K	Voltage Divider
R102	120KΩ	1		BTA-120K	Voltage Divider
R103	8200Ω	1		BTS-8200	Horiz. AFC Filter Network
R104	220KΩ	1		BTA-220K	Horiz. AFC Filter Network-See Note 1
R105	100KΩ 5%	1		BTA-100K-5%	Horiz. Osc. Grid
R106	8200Ω 5%	1		BTS-8200-5%	Horiz. Osc. Transformer Shunt
R107	22KΩ	1		BTS-22K	Horiz. Osc. Transformer Shunt
R108	82KΩ	1		BTA-82K	Horiz. Osc. Plate
R109	18KΩ	1		BTA-18K	Decoupling
R110	100Ω				Parasitic Suppressor
R111	1 Meg.	1		BTS-1 Meg.	Horiz. Output Grid
R112	100Ω	5		1 3/4A-100	Horiz. Output Cathode-Wire Wound

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA FADA PART No.	IRC PART No.	IDENTIFICATION CODES
R113	22KΩ	4			Horiz. Output Screen-See Note 2
R114	1000Ω	1		BTA-1000	Horiz. Linearity Coil Shunt
R115	470KΩ 20%	½		BTS-470K	Voltage Divider
R116	470KΩ 20%	½		BTS-470K	Voltage Divider
R117	10KΩ	½		BTS-10K	Feedback
R118	3.3Ω	½			HV Rect. Filament-Wire Wound
R119	470KΩ	1			HV Rect. Load
R120	470KΩ	1			HV Rect . Load
R121	470KΩ	1			HV Rect. Load
R122	470KΩ	1			HV Rect. Load
R123	3.3Ω	½			HV Rect. Filament-Wire Wound
R124	470Ω	10			Focus Coil Shunt-Wire Wound
R125A	375Ω	25			Filter-Wire Wound
B	350Ω				Bias Network-Wire Wound
C	450Ω				Bias Network-Wire Wound
R126	3000Ω	10		1 3/4A-3000	Voltage Divider-Wire Wound
R127	820Ω	10			Voltage Divider-Wire Wound
R128	400Ω	10		1 3/4A-400	Bias Network-Wire Wound
R129	100Ω	5		1 3/4A-100	Bias Network-Wire Wound

Note 1. Some models use a 270KΩ, 1 watt resistor in this application.
Note 2. Some models use two 47KΩ, 2 watt resistors in parallel to obtain required resistance and wattage.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA FADA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC	720VCT	5VAC	6. 3VAC	42. 58	P-8156 ①		
	② 2. 4A	.290ADC	② 6A	② 1. 2A		P-8134 ②		
				SEC. 4				
				6. 3VAC				
				② 1lA				

① Drill new mounting holes.
② Mount where space is available and use for SEC. #3.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA FADA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	150Ω	1300Ω		A-8111	A-4000	TBO-1	Vert. Block Osc. Trans.
T3	210Ω	63Ω					Hor. Output Trans.
	Tap ②	Tap ②					
	51Ω	53Ω					
		SEC. 2					
		.8Ω					
		SEC. 3					
		0Ω					
		SEC. 4					
		6.9Ω					
T4	590Ω			A-8115	A-3035	TSO-1	Vert. Output Trans.
T5A	13Ω						Hor. Deflection Coil
B	48Ω						Vert. Deflection Coil
T6	930Ω						Focus Coil

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA FADA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T7	10000Ω	4. 5Ω	390Ω	.8Ω		A-3879	A-2932	RO-16	

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA FADA PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	PM	4.5Ω	107. 47	ST-120 MOD. P10-S	10A31	
	CONE DIA.	V. C. DIA.				
SP2	9 1/4"	1"				

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA FADA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.290ADC	60Ω	2. 3 Henries		C-2326 ①	C-2996 ①	TR-3300 ①	① Drill one new mounting hole.

PARTS LIST AND DESCRIPTIONS (Continued)

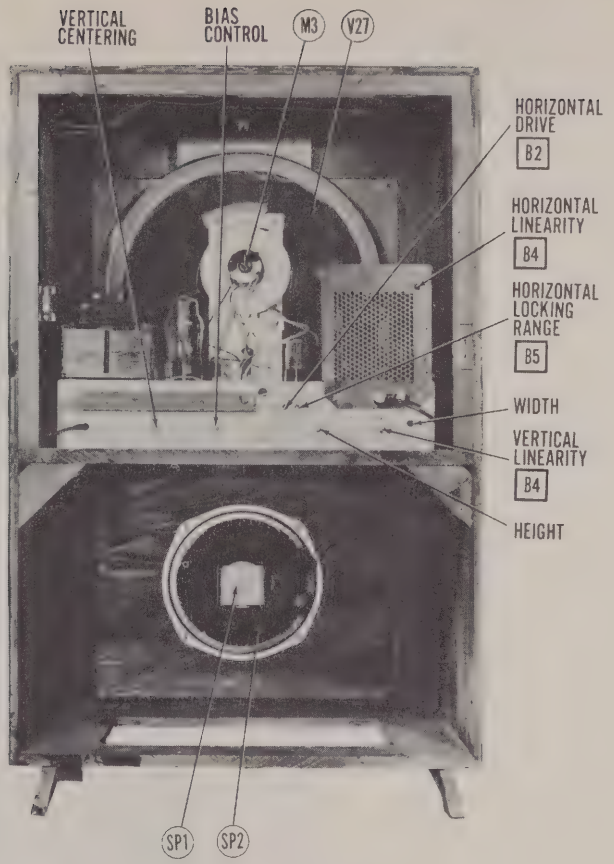
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	FADA PART No.	MEISSNER PART No.	
L2	Ant. Coil	0Ω	0Ω			
L3	RF, Mixer Grid & Osc. Coils	0Ω				
L4	Fil. Choke	0Ω				
L5	Fil. Choke	0Ω				
L6	lst Video IF -Sound Take Off	.1Ω	.1Ω			
L7	lst Video IF Coupling	.1Ω				
L8	Fil. Choke	0Ω				
L9	2nd Video IF	.2Ω				With trap
L10	Fil. Choke	0Ω				
L11	3rd Video IF	.3Ω	.1Ω	37.97		With trap
L12	Fil. Choke	0Ω				
L13	4th Video IF	.3Ω				
L14	Sound Trap	.1Ω	0Ω			
L15	Fil. Choke	0Ω				
L16	5th Video IF	.3Ω				
L17	Fil. Choke	0Ω				
L18	Peaking	4.9Ω			19-1921 †	120 microhenries, blue dot, wound on 22KΩ resistor
L19	Peaking	7.2Ω			19-1922	250 microhenries, green dot
L20	4.5MC Trap	2Ω				
L21	Peaking	6.5Ω			19-1921 *	180 microhenries, white dot, wound on 39KΩ resistor
L22	Peaking	6.5Ω			19-1921 *	180 microhenries, white dot, wound on 39KΩ resistor
L23	Peaking	4.8Ω			19-1920	93 microhenries, red dot
L24	Peaking	6.5Ω			19-1921 *	180 microhenries, white dot, wound on 39KΩ resistor
L25	Peaking	4.9Ω			19-1921 †	120 microhenries, blue dot, wound on 22KΩ resistor
L26	lst Sound IF	.1Ω	.1Ω	37.94		
L27	2nd Sound IF	.1Ω	.1Ω	37.94		
L28	Disc. Trans.	.1Ω	.1Ω	37.95		
L29	Horiz. Osc. Trans.	120Ω	40Ω	87.219		
L30	Horiz. Lin.	5.8Ω				Tap at 1.6Ω
L31	Width Coil	.5Ω				
L32	RF Choke	.1Ω				
L33	RF Choke	.1Ω				

† Parallel with 22KΩ resistor.
* Parallel with 39KΩ resistor.

MISCELLANEOUS

ITEM No.	PART NAME	FADA PART No.	NOTES
M1	RF Tuner		
M2	Fuse		.25A 250V
M3	Ion Trap		

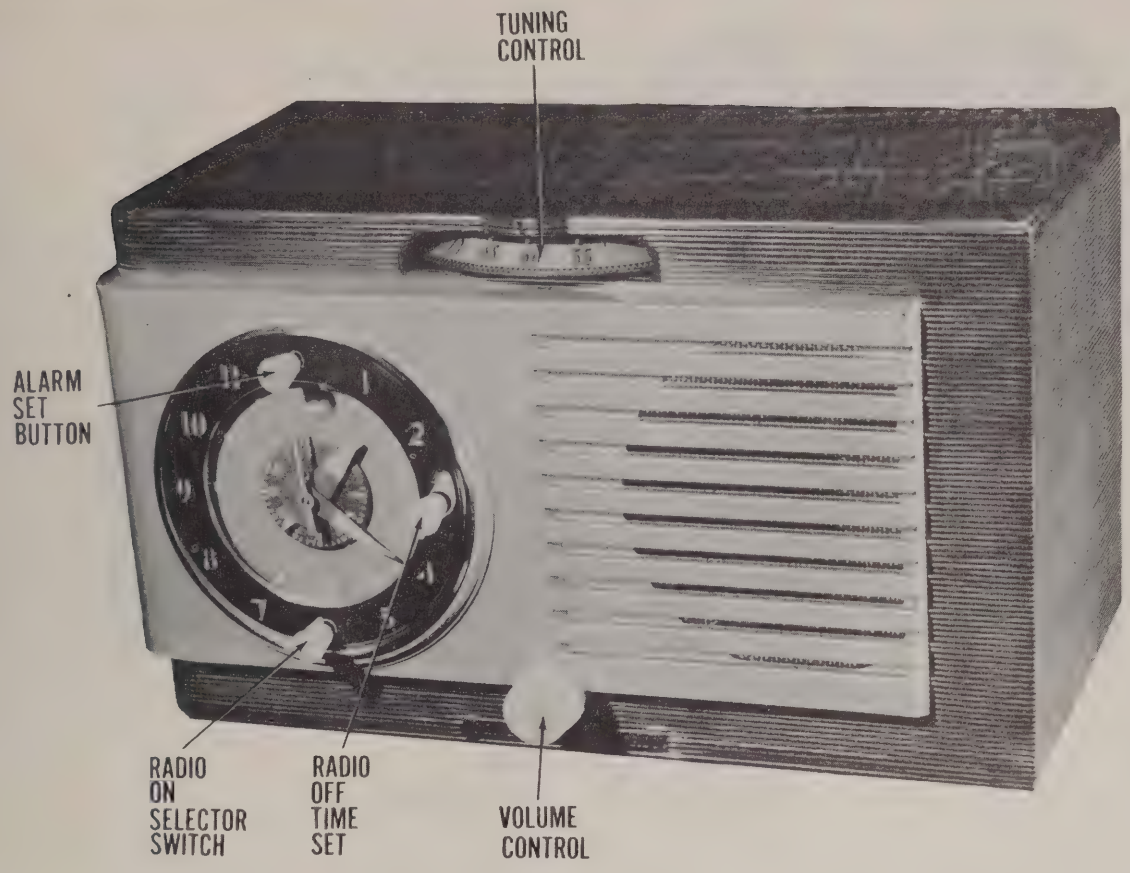


CABINET-REAR VIEW

DISASSEMBLY INSTRUCTIONS

1. Remove eight push-on type control knobs.
2. Remove nine wood screws holding rear cover in place. Remove rear cover.
3. Disconnect built-in antenna.
4. Remove antenna terminal strip.
5. Remove interlock.
6. Remove speaker leads.
7. Remove four 7/16" hex head bolts from chassis.
8. Remove chassis.
9. Remove four 5/16" hex nuts from speaker.
10. Remove speaker.

FOR PICTURE TUBE REMOVAL FOLLOW INSTRUCTIONS ABOVE.



GENERAL ELECTRIC MODEL 521

TRADE NAME	General Electric, Models 521, 522
MANUFACTURER	General Electric Co., Electronics Dept., Electronics Park., Syracuse, New York
TYPE SET	AC Operated Superheterodyne Receiver with Electric Clock
TUBES (FIVE)	Types 12SA7 Converter, 12BA6 IF Amp., 12SQ7 DET-AVC-AF, 50C5 Power Output, 35W4 Rectifier
POWER SUPPLY	105-120 Volts AC — RATING .26 Amp. at 117 Volts AC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set dial scale wheel turn tuning gang fully closed and set wheel until index mark is at 3/16 inch to the right of the 550KC calibration mark on wheel.

Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and B-.

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to pin 8 (Grid) of 12SA7 (V1). Low side to B-.	455KC (400 ~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		Loop	1500KC	Tune for max. output	"	A6	"

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		G. E. PART No.	STANDARD REPLACEMENT		
V1	Converter	12SA7	12SA7	8CT	
V2	IF Amp.	12BA6	12BA6	7BK	
V3	DET.-AVC-AF	12SQ7	12SQ7	8Q	
V4	Power Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	G. E. PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	50	150	RCE-116	PRS150/50-50		EDL5515		TVA-2453	Filter-Red
B	50	150							Filter-Yellow
C2	.05	400	UCC-045	P488-05	DF-503	PTE4S5		4TM-S5	AVC Filter
C3	47	500	RCW-1043	1468-00005	D6-470	5W5Q5	GP1K-47	1FM-45	Osc. Grid Cap.
C4A	220		RCW-3013	SI220	D6-221	5W5T25	GP2K-220		Diode RF Filter
B	2000			BPD-002	DD-202	PTE6D2	811-002	34C3	Audio Coupling
C	220			SI220	D6-221	5W5T25	GP2K-220		AF Amp. Plate Byp.
D	5000			BPD-005	DD-502	PTE6D5	811-005		Audio Coupling
C5	.003	600	RCC-074	P688-003	D6-302	PTE6D3	GP2M-003	6TM-D3	Output Plate Byp.
C6	.05	400	UCC-045	P488-05	DF-503	PTE4S5		72P51	Line Isolation
C7	.05	600	UCC-045	P688-05	DF-503	PTE6S5		6TM-S5	Line Filter

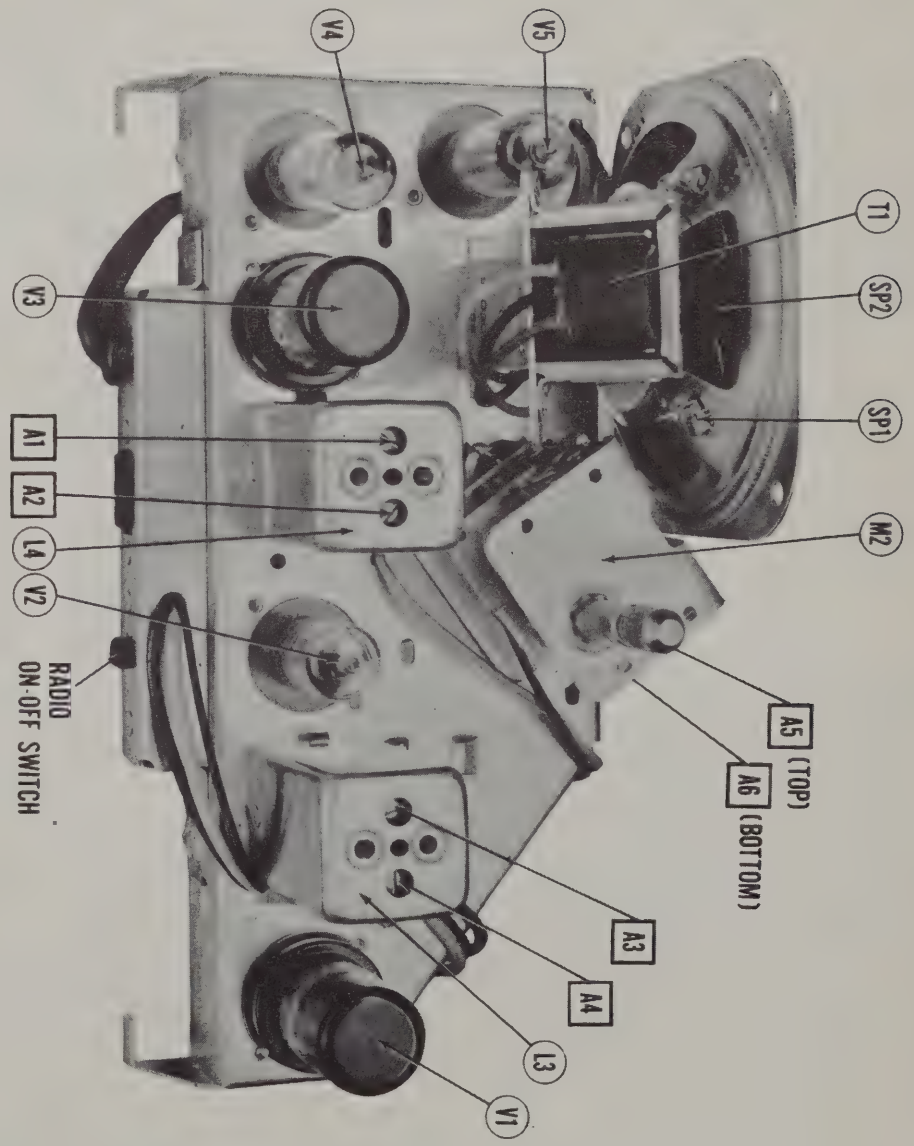
CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	G. E. PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	500KΩ	½	RRC-054	Q13-133	AG-60-Z	BSK-60	Volume control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R1A per instructions

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	G. E. PART No.	IRC PART No.	
R2	22KΩ	½	URD-081	BTS-22K	Osc. Grid
R3	2.2 Meg.	½	URD-129	BTS-2.2 Meg.	AVC Network
R4	47Ω	½	URD-017	BW-½-47	IF Amp. Cathode
R5	6.8 Meg.	½	URD-141	BTS-6.8 Meg.	AF Amp. Grid
R6	470KΩ	½	URD-113	BTS-470K	AF Amp. Plate
R7	470KΩ	½	URD-113	BTS-470K	Output Grid
R8	150Ω	½	URD-029	BTS-150	Output Cathode
R9	22Ω	½	URD-009		Surge Limiter
R10	1000Ω	2	URF-049	BTB-1000	Filter
R11	470KΩ	½	URD-113	BTS-470K	Isolation

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		G. E. PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2200Ω	3.9Ω	265Ω Tap ⓐ 7Ω	.5Ω	RTO-036	A-3330 ①	A-3031 ①	RO-3 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			G. E. PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	V. C. IMP.		ST-113 ③		
SP1	PM	3.9Ω	S400C	MOD-P4-X	4A07 ②	② Use universal mounting bracket provided. ③ Fabricate new mounting bracket.
	CONE DIA.	V. C. DIA.				
SP2	4"	9/16"				

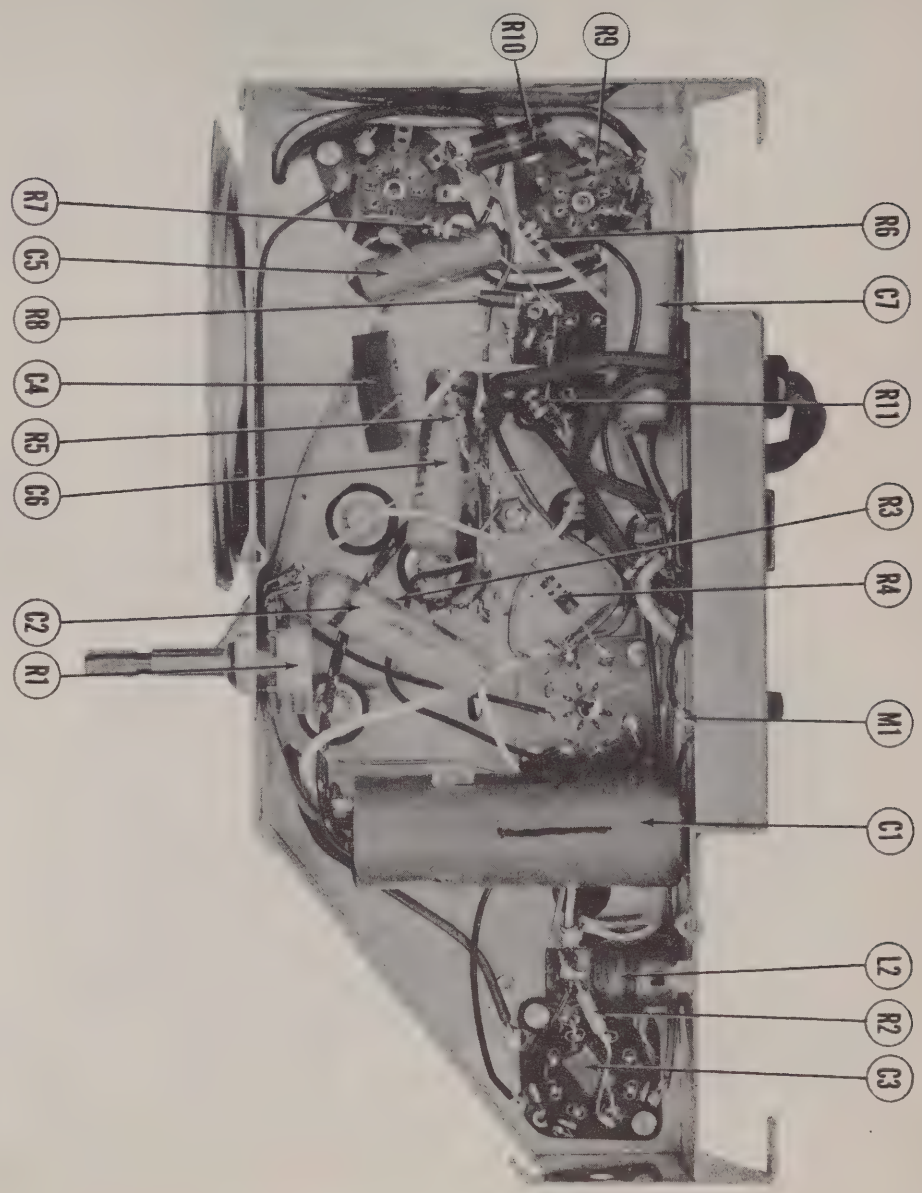
R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	G. E. PART No.	MEISSNER PART No.	
L1	Loop Ant.	3.4Ω		RAB-135		Includes cabinet back
L2	Osc. Coil	.5Ω	7Ω	RLC-090	14-1073	
L3	1st IF	25Ω	25Ω	RTL-094	16-6658	
L4	2nd IF	25Ω	25Ω	RTL-095	16-6660	

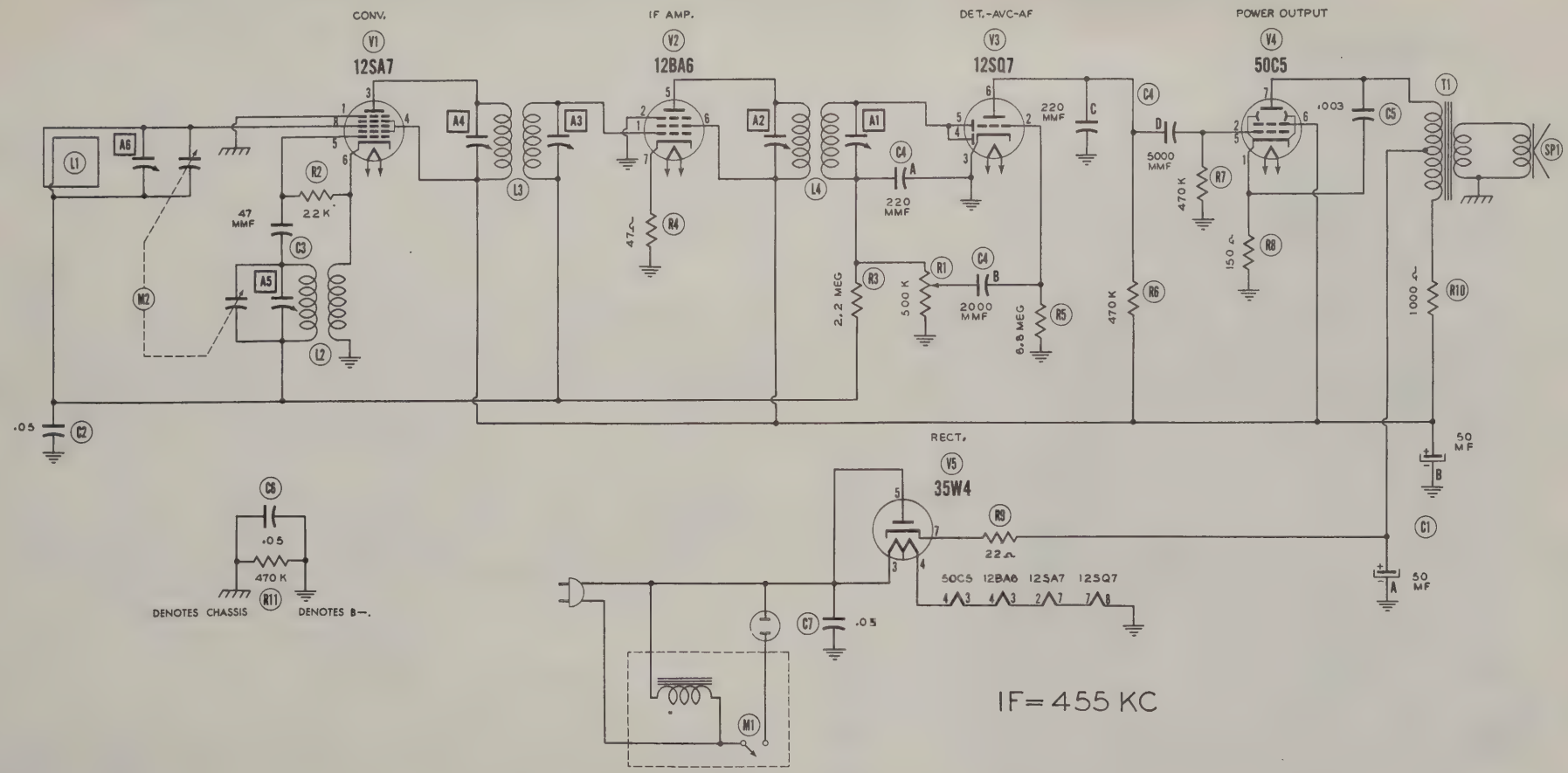
MISCELLANEOUS

ITEM No.	PART NAME	G. E. PART No.	NOTES
M1	Switch	RSW-067	On-Off
M2	2 Gang Var. Cap.	RCT-045	(28-470MMF, 21-192MMF)
	Dial Scale	RDS-090	
	Knob	RDK-218	Volume
	Knob	RDK-217	Tuning
	Cabinet	RAU-342	Model 521
	Cabinet	RAU-343	Model 522
	Clock	RZC-009	

CHASSIS—BOTTOM VIEW



GENERAL ELECTRIC MODELS 521, 522



IF = 455 KC

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7	0V	24VAC	90VDC	90VDC	5-7VDC	0V	12VAC	-.2VDC
V 2	12BA6	-.2VDC	0V	24VAC	35VAC	90VDC	90VDC	.6VDC	
V 3	12SQ7	0V	-.6VDC	0V	-.6VDC	-.6VDC	45VDC	12VAC	0V
V 4	50C5	6.2VDC	0V	35VAC	85VAC	0V	90VDC	110VDC	
V 5	35W4	118VDC	118VDC	117VAC	85VAC	117VAC	90VAC	120VDC	

§ TAKEN WITH VACUUM TUBE VOLTEMETER

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7	470KΩ	24Ω	†1KΩ	†1KΩ	22KΩ	.5Ω	12Ω	2.7 Meg.
V 2	12BA6	2.7 Meg.	0Ω	24Ω	35Ω	†1KΩ	†1KΩ	47Ω	
V 3	12SQ7	470KΩ	6.8 Meg.	0Ω	500KΩ	500KΩ	†470KΩ	12Ω	0Ω
V 4	50C5	150Ω	470KΩ	35Ω	85Ω	470KΩ	†1KΩ	†280Ω	
V 5	35W4	†29Ω	†22Ω	120Ω	85Ω	120Ω	95Ω	70KΩ	

† MEASURED FROM PIN 7 OF V5

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A PHOTOFACT STANDARD NOTATION SCHEMATIC

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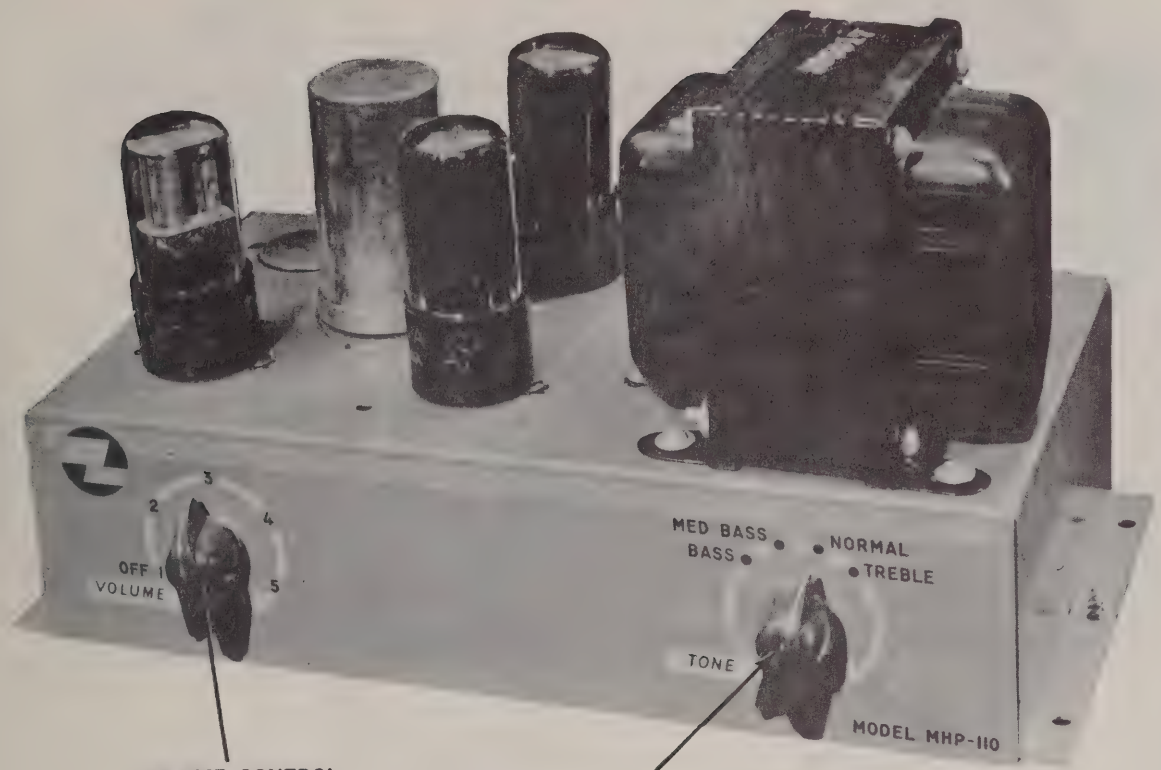
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

MASCO
MODEL MHP-110



MASCO
MODEL MHP-110

MASCO MODEL MPH-110

TRADE NAME	Masco, Model MPH-110		
MANUFACTURER	Mark Simpson Mfg. Co., Inc., 32-28 49th St., Long Island City, New York		
TYPE SET	AC Operated Audio Amplifier		
TUBES (FOUR)	Types 6SL7 AF Amp. -Phase Inverter, (2) 6V6GT Power Output, 5Y3GT Rectifier		
POWER SUPPLY	105-125 Volts AC	RATING	.60 Amp. at 117 Volts AC

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PARTS LIST AND DESCRIPTIONS

MASCO
MODEL MPH-110

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MASCO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	AF Amp.-Phase Inv.	6SL7	6SL7	8BD	
V2	Power Output	6V6GT	6V6GT	7AC	
V3	Power Output	6V6GT	6V6GT	7AC	
V4	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MASCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	20	450		AF444J		UP22245		TVL-3780	▲ Filter
B	20	450							■ Filter
C	10	450							▲ Filter
C2	50	50		PRS50/50		BR505		TVA-1308	AF Amp. Cath.
C3	50	50		PRS50/50		BR505		TVA-1308	Output Cath.
C4	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Audio Coupling
C5	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Audio Coupling
C6	.1	600		P688-1	DF-104	PTE6P1		6TM-P1	Tone Compensation
C7	.005	600		P688-005	D6-502	PTE6D5	811-005	6TM-D5	Tone Compensation

CONTROLS

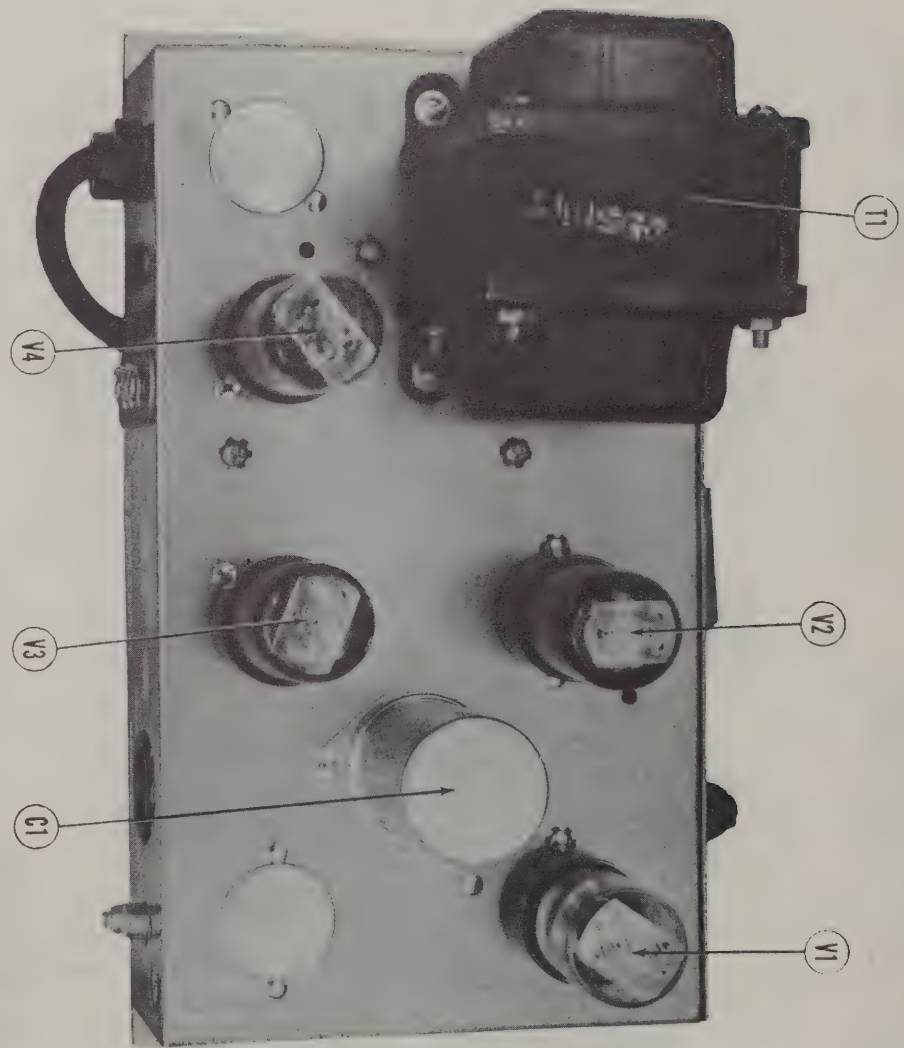
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MASCO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	500KΩ	½		Q13-133	AM-60-Z	B-60-S	Volume control
B	Shaft			Not Req.	RS-2	Not Req.	Attach to R1A per instructions
C	Switch			76-1	SW-A	Not Req.	Attach to R1A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MASCO PART No.	IRC PART No.	IDENTIFICATION CODES
R2	470Ω	½		BTS-470	AF Amp. Cathode
R3	1500Ω	½		BTS-1500	AF Amp. Cathode
R4	150KΩ	½		BTS-150K	AF Amp. Plate
R5	10KΩ	½		BTS-10K	Phase Inverter Grid
R6	1500Ω	½		BTS-1500	Phase Inverter Cathode
R7	150KΩ	½		BTS-150K	Phase Inverter Plate
R8	270KΩ	½		BTS-270K	Output Grid
R9	270KΩ	½		BTS-270K	Output Grid
R10	250Ω	5		1 3/4A-250	Output Cathode-Wire Wound
R11	3600Ω	½		BTS-3300	Feedback-See Note 1
R12	3600Ω	½		BTS-3300	Feedback-See Note 1
R13	3600Ω	½		BTS-3300	Tone Compensation-See Note 1
R14	10KΩ	½		BTS-10K	Filter
R15	2700Ω	1		BTA-2700	Filter

Note 1. Some models use 3300Ω resistor in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	MASCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ .60A	660VCT .075ADC	5VAC @ 2A	6.3VAC @ 1.4A	P-8	PC-8409①	P-3152 ①	PV-70①'

① Drill new mounting holes.

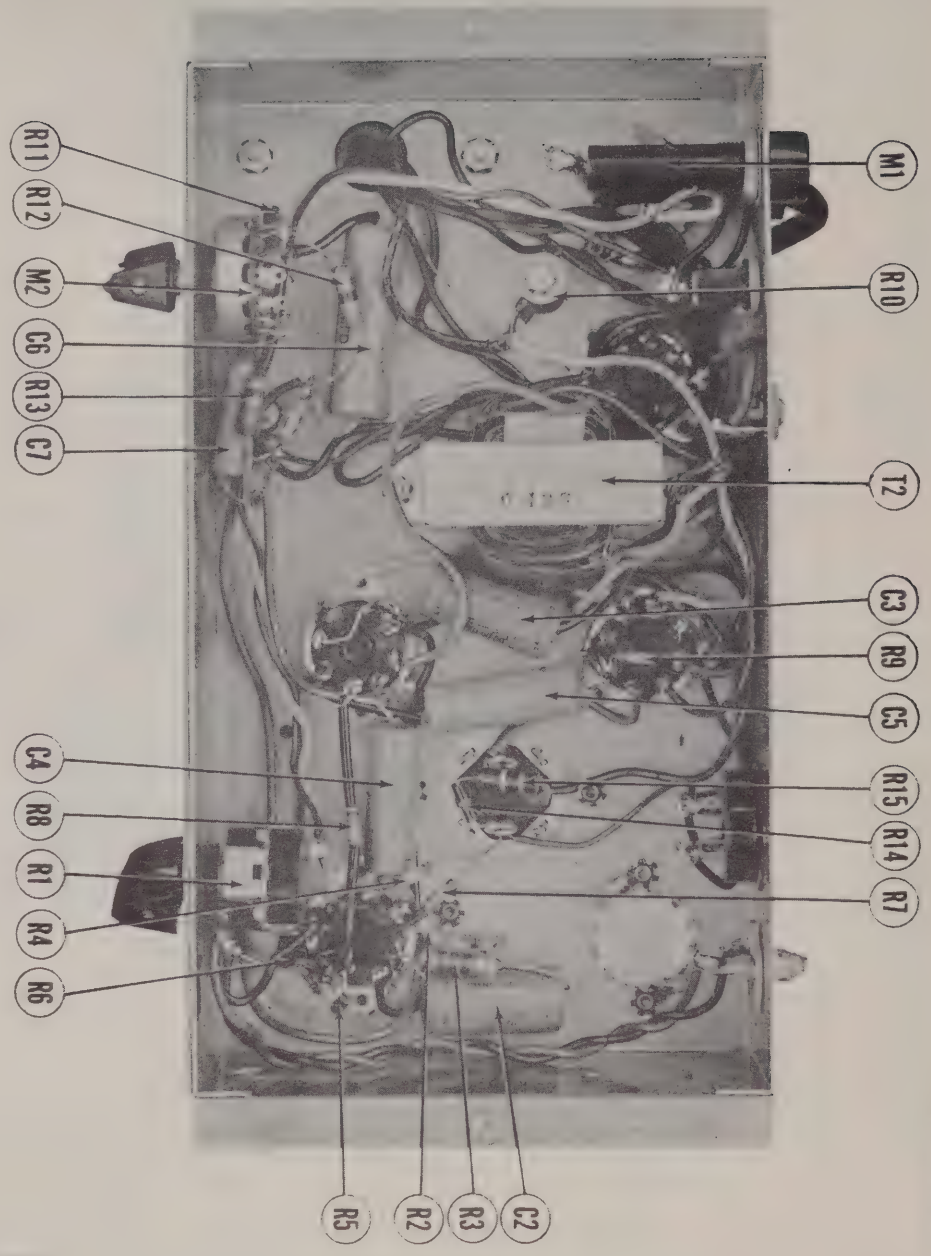
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		MASCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	9300Ω	4Ω 8Ω	450Ω	.7Ω .9Ω	0-12-S	A-3824		RO-110	

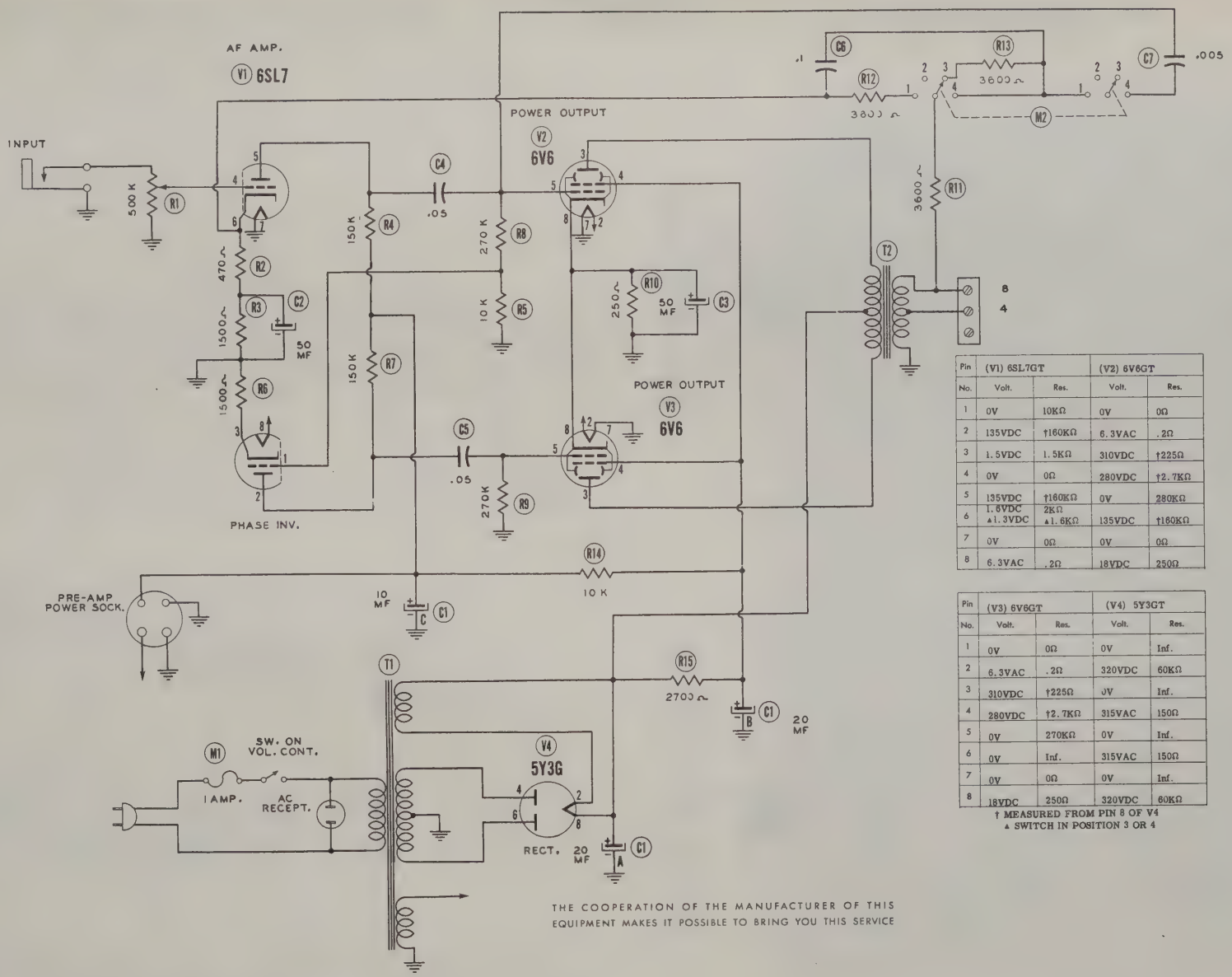
MISCELLANEOUS

ITEM No.	PART NAME	MASCO PART No.	NOTES
M1	Fuse		1 Amp. Type 3AG
M2	Switch		Tone

CHASSIS—BOTTOM VIEW



MASCO MODEL MPH-110



Pin No.	(V1) 6SL7GT Volt.	(V1) 6SL7GT Res.	(V2) 6V6GT Volt.	(V2) 6V6GT Res.
1	0V	10KΩ	0V	0Ω
2	135VDC	†160KΩ	6.3VAC	.2Ω
3	1.5VDC	1.5KΩ	310VDC	†225Ω
4	0V	0Ω	280VDC	†2.7KΩ
5	135VDC	†160KΩ	0V	280KΩ
6	1.8VDC ▲1.3VDC	2KΩ ▲1.6KΩ	135VDC	†160KΩ
7	0V	0Ω	0V	0Ω
8	6.3VAC	.2Ω	18VDC	250Ω

Pin No.	(V3) 6V6GT Volt.	(V3) 6V6GT Res.	(V4) 5Y3GT Volt.	(V4) 5Y3GT Res.
1	0V	0Ω	0V	Inf.
2	6.3VAC	.2Ω	320VDC	60KΩ
3	310VDC	†225Ω	0V	Inf.
4	280VDC	†2.7KΩ	315VAC	150Ω
5	0V	270KΩ	0V	Inf.
6	0V	Inf.	315VAC	150Ω
7	0V	0Ω	0V	Inf.
8	18VDC	250Ω	320VDC	60KΩ

† MEASURED FROM PIN 8 OF V4
▲ SWITCH IN POSITION 3 OR 4

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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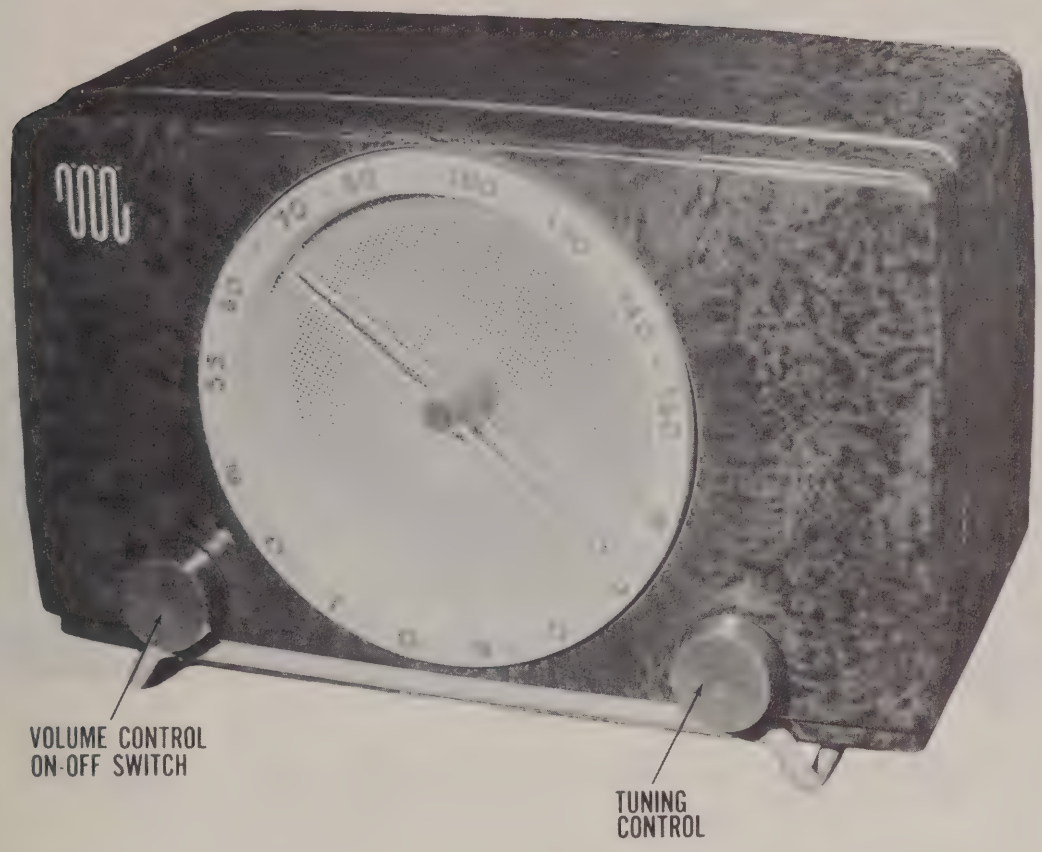
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

MOTOROLA MODELS 5X11U, 5X12U, 5X13U (Ch. HS-243)



MOTOROLA MODELS 5X11U, 5X12U, 5X13U (Ch. HS-243)

MOTOROLA MODEL 5X11U

TRADE NAME	Motorola, Models 5X11U, 5X12U, 5X13U (Ch. HS-243)
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago, Illinois
TYPE SET	AC-DC Operated Superheterodyne Receiver with Loop Antenna
TUBES (FIVE)	Types 12BE6 Converter, 12BA6 IF Amp., 12AT6 DET-AVC-AF, 50C5 Power Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC — RATING .24 Amp. at 117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and B-. Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (Grid) of 12BE6 (V1). Low side to B-.	455KC (400 ∿ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	.1MFD	"	1620KC	"	"	A5	"
3.		Loop	1400KC	Tune for max. output	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

MOTOROLA MODEL 5X11U

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amp.	12BA6	12BA6	7BK	
V3	DET.-AVC-AF	12AT6	12AT6	7BT	
V4	Power Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	50	150	23B600855	PRS150/50-30		EDL5315		TVA-2450	Filter-Red
B	30	150							Filter-Green
C2	.05	200	8R9821	P288-05	DF-503	PTE4S5		2TM-S5	AVC Filter
C3A	220		21B482847	SI220	D6-221	5W5T25	GP2K-220		Diode RF Filter
B	2000			BPD-002	DD-202	PTE6D2	811-002		Audio Coupling
C	220			SI220	D6-221	5W5T25	GP2K-220	34C3	AF Amp. Plate Byp.
D	5000			BPD-005	DD-502	PTE6D5	811-005		Audio Coupling
C4	.25	50	8A470504	P488-25		GT2P25		2TM-P25	Tone Compensation
C5	.02	400	8R9802	P488-02	DF-203	PTE4S2		4TM-S2	Output Plate Byp.
C6	.15	200	8R9843	P288-15		GT4P2		72P53	Line Isolation
C7	.05	400	8R9816	P488-05	DF-503	PTE4S5		4TM-S5	Line Filter
C8A	220		21B601007 *	SI220		5W5T25	GP2K-220	19C13	Diode RF Filter *
B	2000			BPD-002		PTE6D2	811-002	29C2	Audio Coupling *
C	110			SII20	PC-150 *	5W5T15	GP2K-120	19C29	AF Amp. Plate Byp. *
D	5000			BPD-005		PTE6D5	811-005	29C1	Audio Coupling *
E	110			SII20		5W5T15	GP2K-120	19C29	Output Grid Byp. *

* Items C8A, C8B, C8C, C8D, C8E, R14A, R14B, R14C are combined into one unit. In sets using a multiplate capacitor, items C8A, C8B, C8C, and C8D are replaced by C3A, C3B, C3C and C3D respectively.

CONTROLS

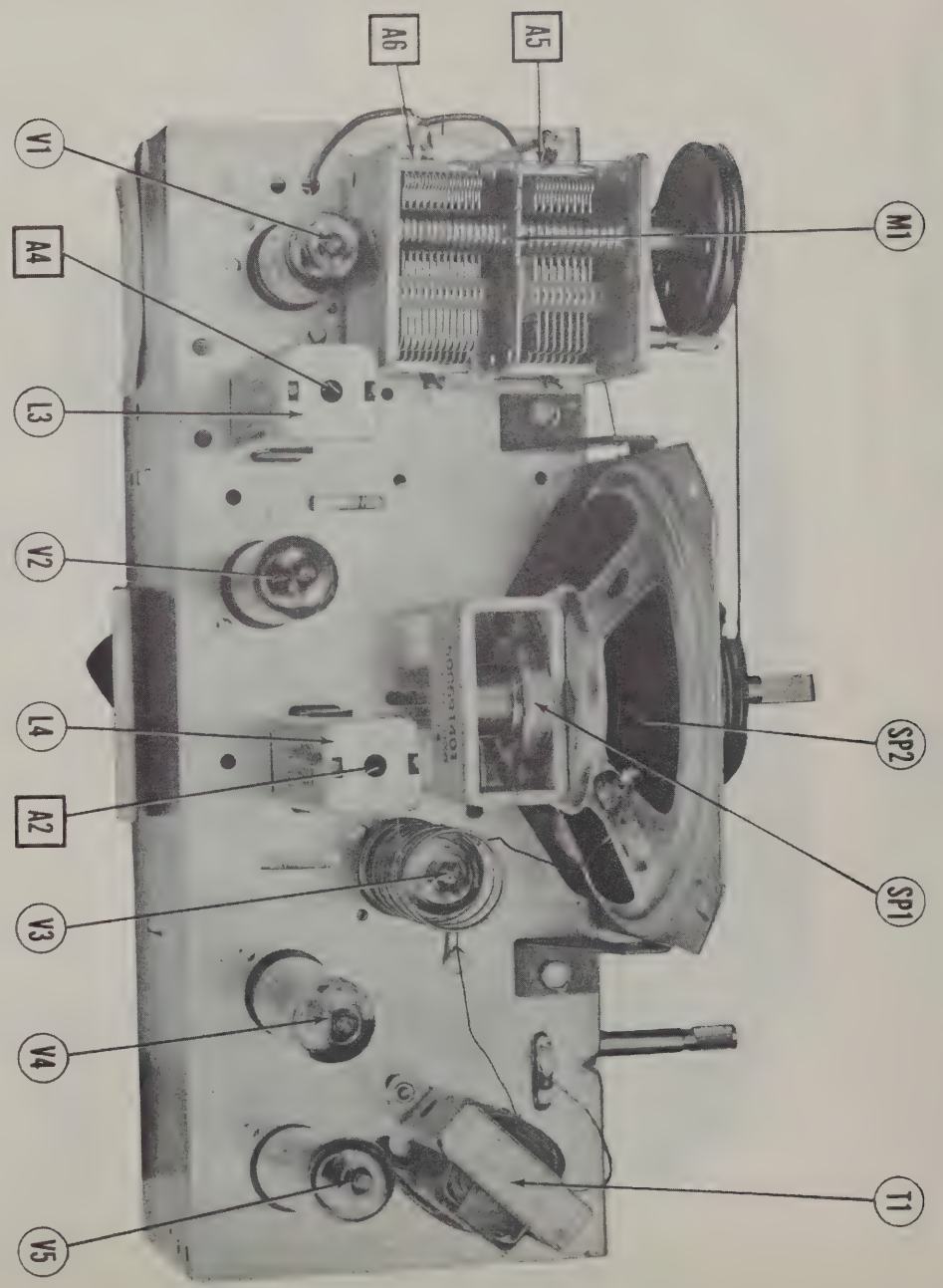
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.		INSTALLATION NOTES
R1A	1 Meg.	½	18K600474	Q13-137	AG-63-Z	BSK-70-S	Volume control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R1A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	IDENTIFICATION CODES
R2	22KΩ	½	6R6028	BTS-22K	Osc. Grid
R3	100Ω	½	6R6018	BTS-100	IF Cathode
R4	3.3 Meg.	½	6R2118	BTS-3.3 Meg.	AVC Network
R5	10 Meg.	½	6R2109	BTS-10 Meg.	AF Amp. Grid-See Note 1
R6	100Ω	½	6R6326	BTS-100	AF Amp. Cathode-See Note 1
R7	470KΩ	½	6R6032	BTS-470K	AF Amp. Plate
R8	1500Ω	½	6R6038	BTS-1500	Feedback
R9	1500Ω	½	6R6038	BTS-1500	Feedback
R10	470KΩ	½	6R6032	BTS-470K	Output Grid-See Note 1
R11	150Ω	½	6R3992	BTS-150	Output Cathode
R12	1000Ω	1	6R3953	BW-1-1000	Filter
R13	33Ω	½	6R5683		Surge Limiter-See Note 2
R14A	6.8 Meg.	½		BTS-6.8 Meg.	AF Amp. Grid
B	470KΩ	½	†	BTS-470K	AF Amp. Plate
C	470KΩ	½		BTS-470K	Output Grid

Note 1. R5, R6, and R10 are used in sets using multiplate capacitor only.
Note 2. Some models use a 27Ω resistor in this application.
† Items R14A, R14B, R14C, C8A, C8B, C8C, C8D and C8E are combined into one unit. See C8 for parts listing.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2200Ω	3.2Ω	170Ω	.4Ω	25K485973	A-3332	A-3025 ①	RO-2 ①	① Drill one new mounting hole.

SPEAKER

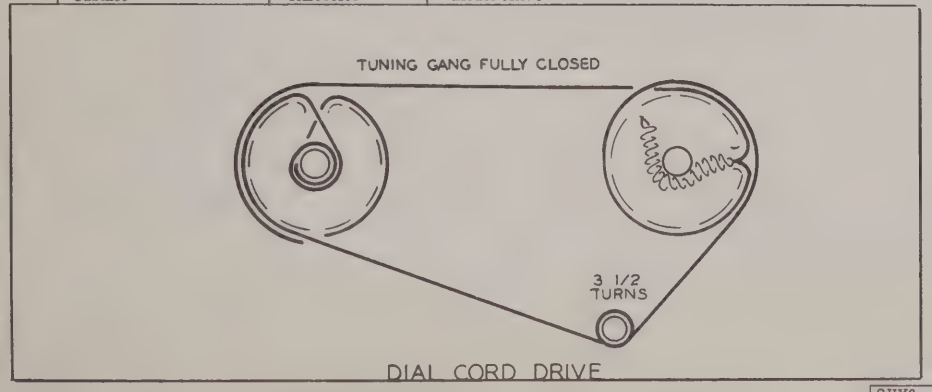
ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			MOTOROLA PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	V. C. IMP.		ST-113		
SP1	PM	3.2Ω	50C691401	MOD. P4-X	4A07	
	CONE DIA.	V. C. DIA.				
SP2	4"	9/16"				

R F COILS

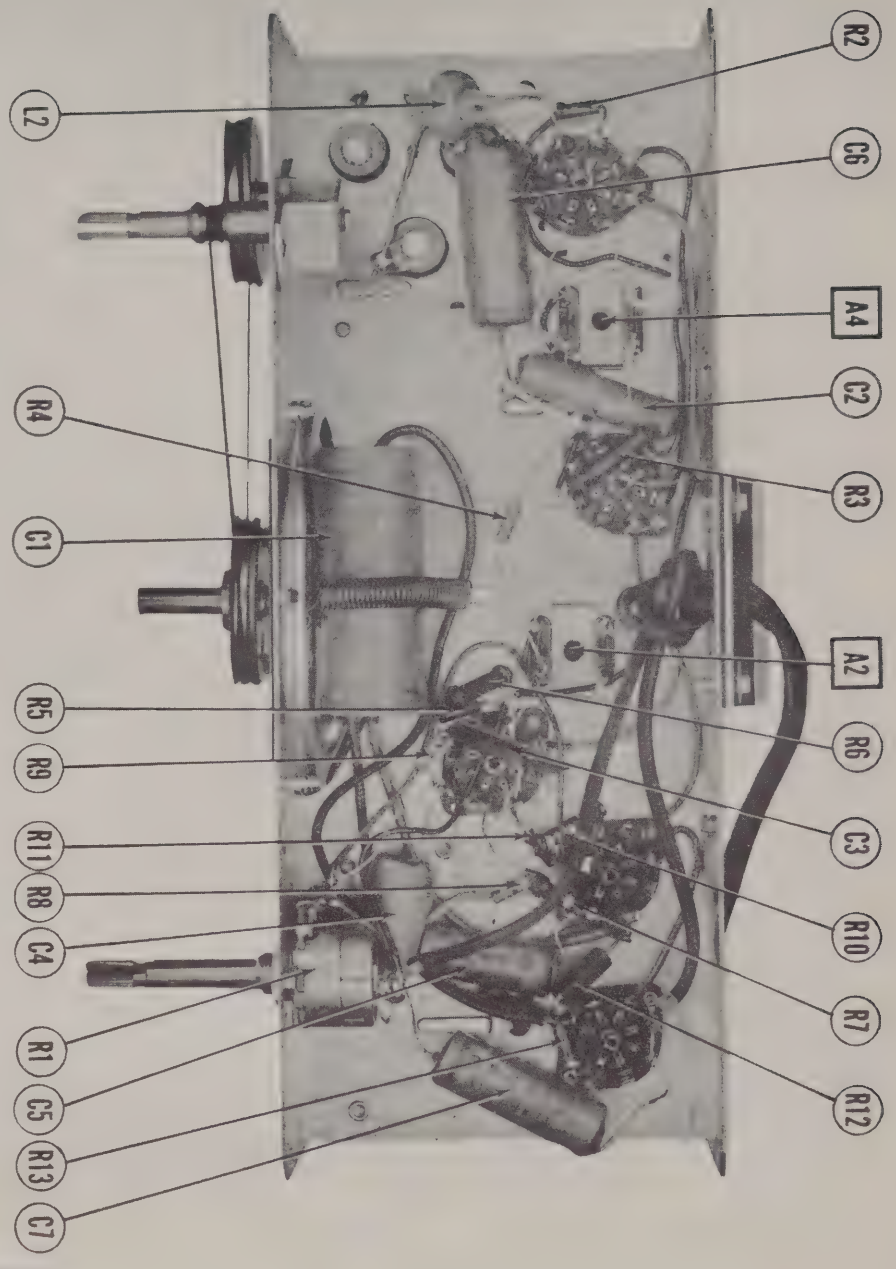
ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	
L1	Loop Ant.	3.3Ω		24C600517		
L2	Osc. Coil	.9Ω	11.6Ω	24K600812	14-1073	
L3	1st IF	19Ω	19Ω	24B485553	16-6758	
L4	2nd IF	19Ω	19Ω	24B485553	16-6758	

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M1	2 Gang Var. Cap.	19B600483	(25-347MMF, 14-167MMF)
	Dial Pointer	52A600451	Models 5X11U, 5X12U
	Dial Pointer	52K600453	Model 5X13U
	Knob	36B600570	Pointer, Walnut
	Knob	36K600571	Pointer, Ivory
	Knob	36K600572	Pointer, Black
	Knob	36B600455	Tuning, Walnut
	Knob	36K600456	Tuning, Ivory
	Knob	36K600457	Tuning, Black
	Cabinet	16E600187	Model 5X11U
	Cabinet	16K600191	Model 5X12U
	Cabinet	16K600189	Model 5X13U



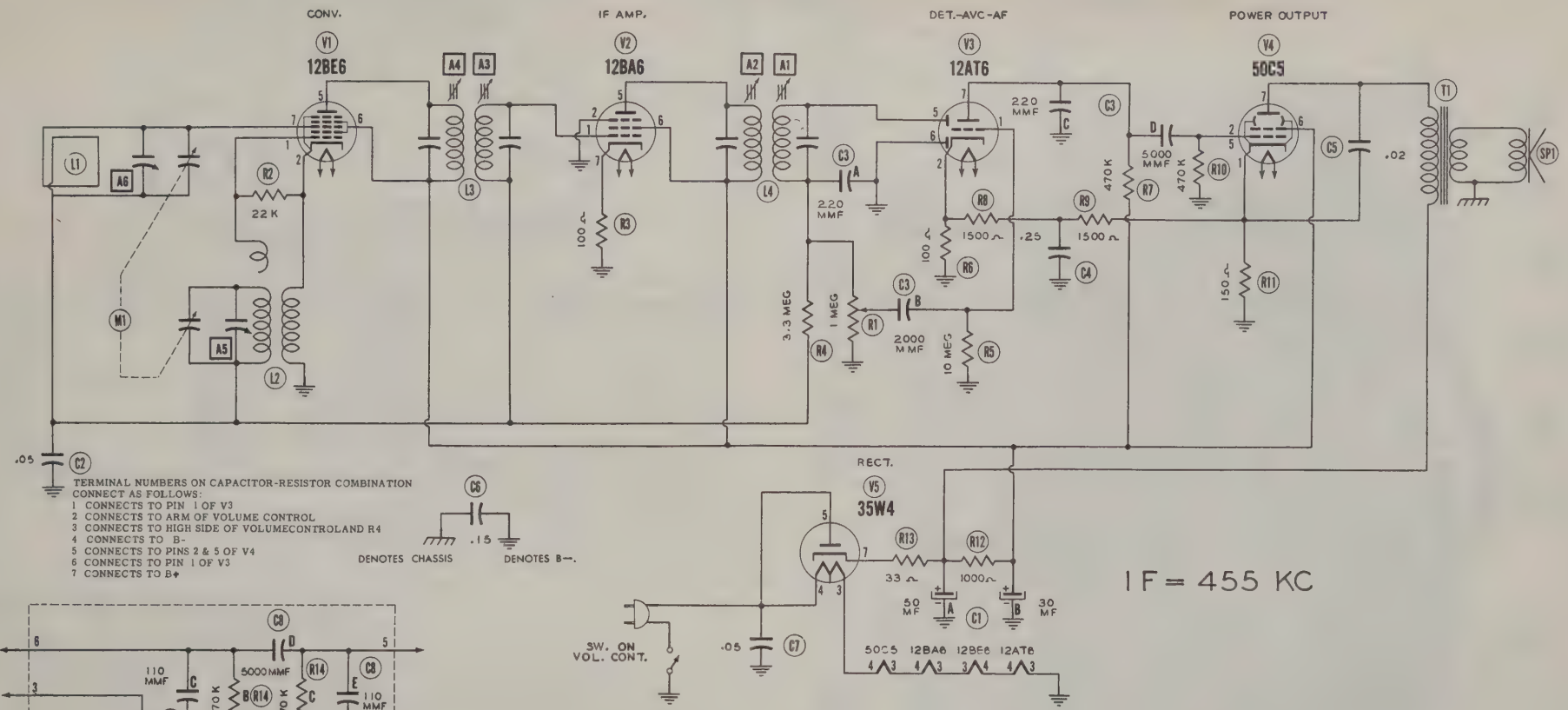
CHASSIS—BOTTOM VIEW



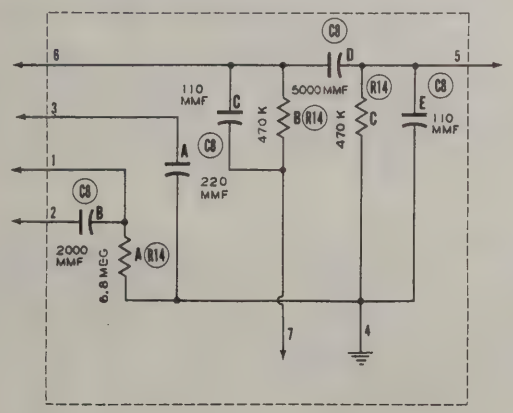
SET 114 FOLDER 7

MOTOROLA MODEL 5X11U

MOTOROLA MODEL 5X11U



TERMINAL NUMBERS ON CAPACITOR-RESISTOR COMBINATION
CONNECT AS FOLLOWS:
1 CONNECTS TO PIN 1 OF V3
2 CONNECTS TO ARM OF VOLUME CONTROL
3 CONNECTS TO HIGH SIDE OF VOLUMECONTROLAND R4
4 CONNECTS TO B-
5 CONNECTS TO PINS 2 & 5 OF V4
6 CONNECTS TO PIN 1 OF V3
7 CONNECTS TO B+



IF = 455 KC

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	§-7.6VDC	0V	24VAC	12VAC	90VDC	90VDC	-.2VDC
V 2	12BA6	-.2VDC	0V	24VAC	35VAC	90VDC	90VDC	1VDC
V 3	12AT6	-.7VDC	.2VDC	0V	12VAC	-.4VDC	0V	45VDC
V 4	50C5	6.4VDC	.2VDC	35VAC	85VAC	.2VDC	90VDC	105VDC
V 5	35W4	113VDC	0V	85VAC	117VAC	117VAC	105VAC	115VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.9Ω	25Ω	13Ω	†1KΩ	†1KΩ	4.3 Meg.
V 2	12BA6	4.3 Meg.	0Ω	25Ω	36Ω	†1KΩ	†1KΩ	100Ω
V 3	12AT6	10 Meg.	100Ω	0Ω	13Ω	1 Meg.	0Ω	†470KΩ
V 4	50C5	150Ω	470KΩ	36Ω	85Ω	470KΩ	†1KΩ	†200Ω
V 5	35W4	†33Ω	Inf.	85Ω	120Ω	120Ω	110Ω	65KΩ

† MEASURED FROM PIN 7 OF V5

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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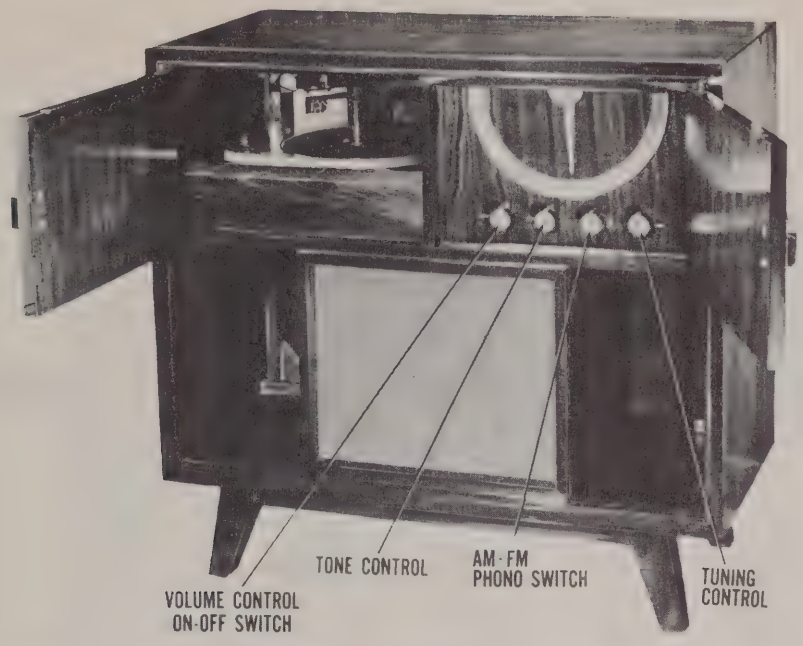
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

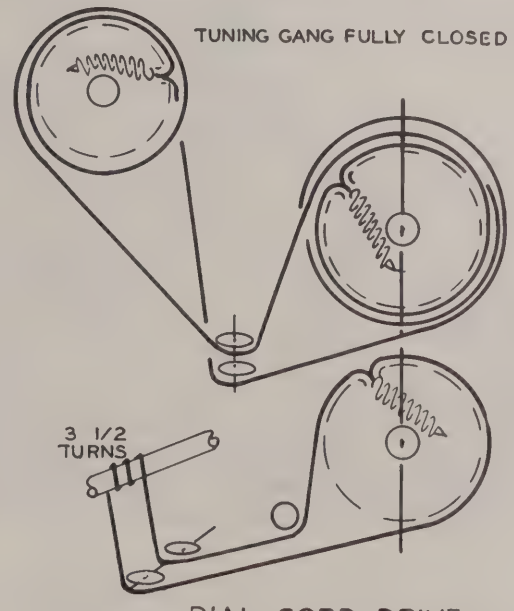
MOTOROLA MODELS 9FM21, 9FM21B (Ch. HS-246)



MOTOROLA MODEL 9FM21

TRADE NAME	Motorola, Models 9FM21, 9FM21B (Ch. HS-246)		
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago, Illinois		
TYPE SET	AC Operated Combination Phono-Radio, AM-FM Superheterodyne Receiver with Loop Antenna		
TUBES (NINE)	Types 6AU6 FM-AM RF Amp., 6BA7 FM-AM Converter, 6BA6 FM-AM 1st IF Amp., 6AU6 2nd FM IF Amp., 6AL5 Ratio Detector, 6AV6 AM DET-AVC-AF, (2) 6V6GT Power Output, 7Z4 Rectifier		
POWER SUPPLY	110-120 Volts AC	RATING	.65 Amp. at 117 Volts AC
TUNING RANGE-BROADCAST	535-1620KC	FREQ. MOD.	88-108MC

RECORD CHANGER --- MOTOROLA MODEL RC-37



DIAL CORD DRIVE

HOWARD W. SAMS & CO., INC. • Indianapolis 1, Indiana

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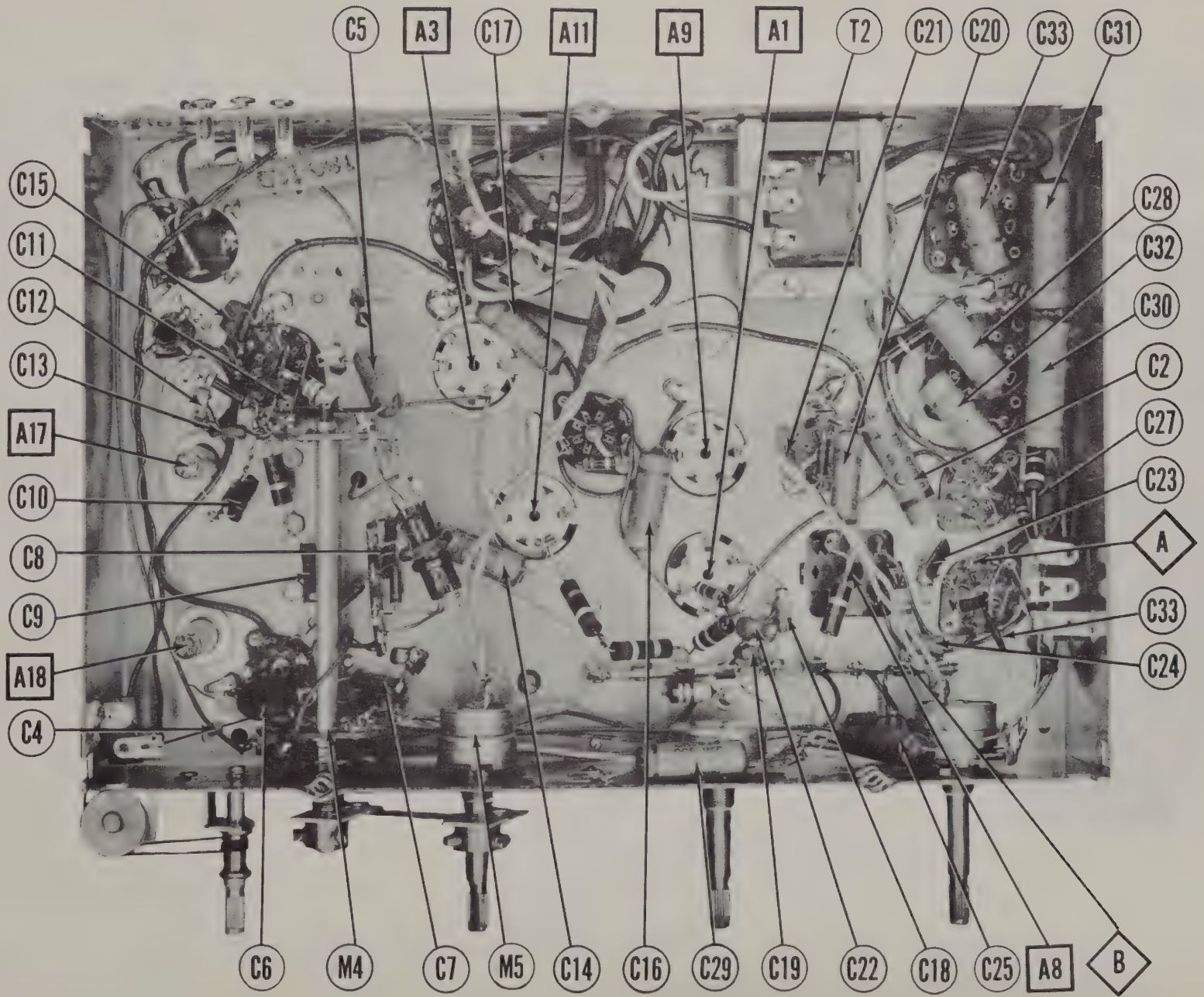
C5
A3
C17
A11
A9
A1
T2
C21
C20
C33
C31
C15
C11
C12
C13
A17
C10
C8
C9
A18
C4
C28
C32
C30
C2
C27
C23
A
C33
C24
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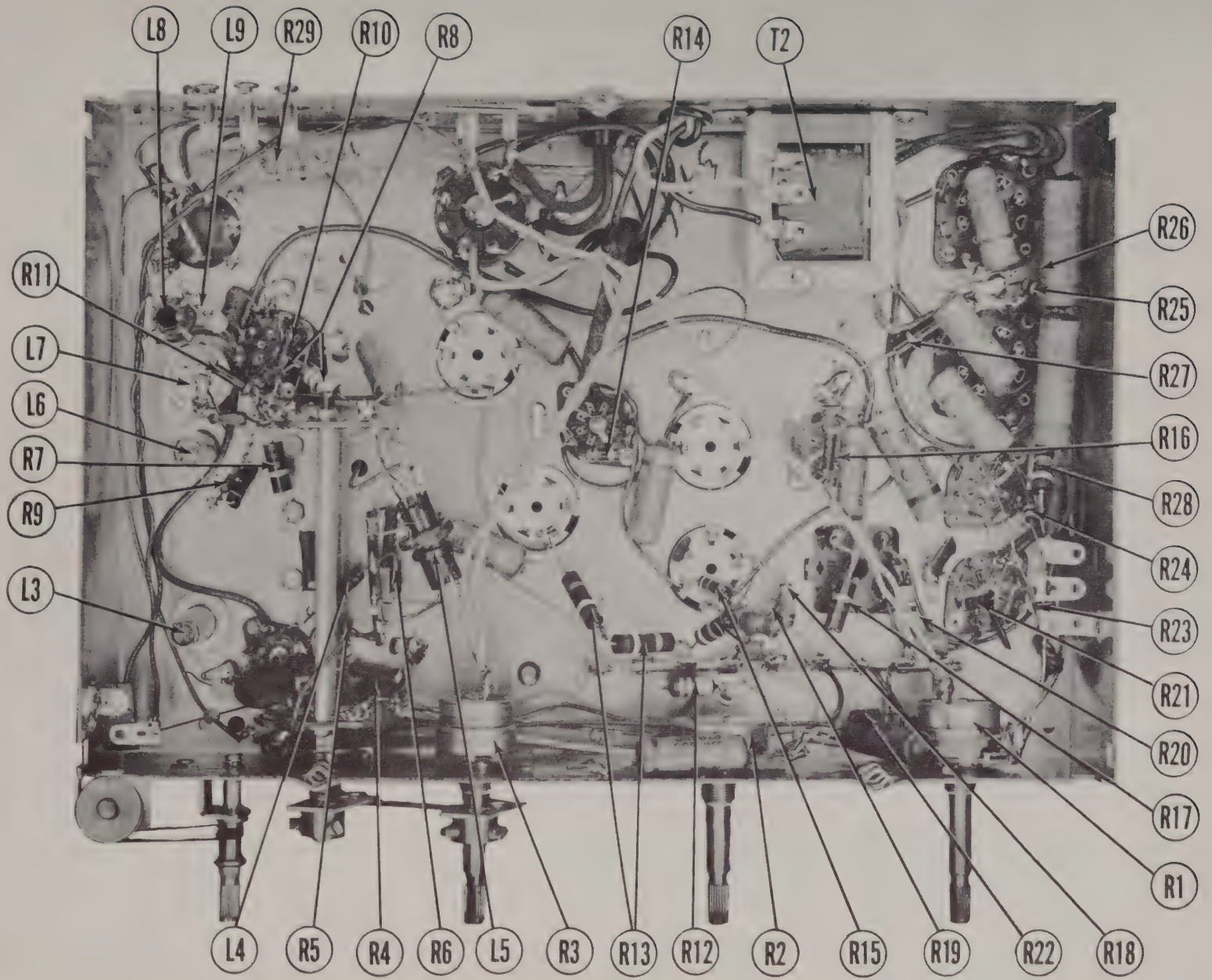
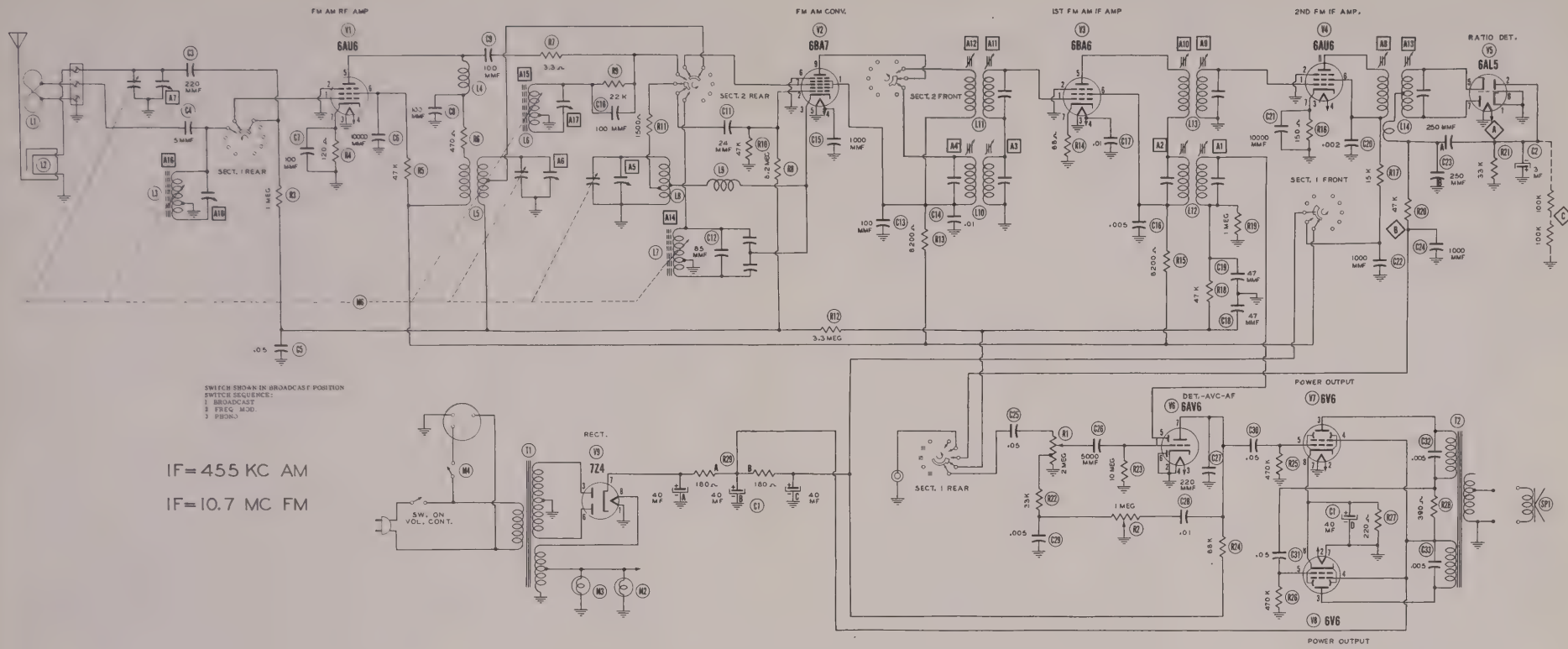
M4
C7
M5
C14
C16
C29
C19
C22
C18
C25
A8
B


L8
L9
R29
R10
R8
R14
T2
R26
R11
R25
L7
R27
L6
R16
R7
R28
R9
R24
L3
R23
R21
R20
R17
R1
L4
R5
R4
R6
L5
R3
R13
R12
R2
R15
R19
R22
R18



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AU6	†.9V ▲-.3VDC	0V	0V	6.3VAC	†200VDC ▲210VDC	†105VDC ▲150VDC	†1.2VDC ▲-.7VDC		
V 2	6BA7	†95VDC ▲100VDC	†5.4VDC ▲5.7VDC	0V	6.3VAC	0V	0V	†-.4VDC ▲-.6VDC	0V	95VDC
V 3	6BA6	0V	0V	0V	6.3VAC	90VDC	90VDC	1VDC		
V 4	6AU6	0V	0V	0V	6.3VAC	†95VDC	†95VDC	†1.2VDC		
V 5	6AL5	0V	†-1.3VDC	6.3VAC	0V	†-.8VDC	0V	†.8VDC		
V 6	6AV6	▲.8VDC	0V	6.3VAC	0V	▲-.3VDC	0V	135VDC		
V 7	6V6GT	0V	6.3VAC	200VDC	215VDC	0V	205VDC	0V	14VDC	
V 8	6V6GT	0V	6.3VAC	210VDC	215VDC	0V	0V	0V	14VDC	
V 9	7Z4	0V	0V	245VAC	0V	0V	245VAC	250VDC	7VAC	

† TAKEN WITH VACUUM TUBE VOLTMETER

‡ TAKEN IN FM POSITION
▲ AM POSITION

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AU6	†Ω ▲5.3 Meg.	0Ω	0Ω	.1Ω	†830Ω	†47KΩ	120Ω		
V 2	6BA7	†8.1KΩ	47KΩ	2.4Ω	.1Ω	0Ω	0Ω	†22KΩ ▲3 Meg.	0Ω	†8.5KΩ
V 3	6BA6	15Ω	0Ω	0Ω	.1Ω	†8.1KΩ	†8.1KΩ	88Ω		
V 4	6AU6	.8Ω	0Ω	0Ω	.1Ω	††15KΩ	††15KΩ	150Ω		
V 5	6AL5	0Ω	33KΩ	.1Ω	0Ω	Inf.	0Ω	Inf.		
V 6	6AV6	10 Meg.	0Ω	.1Ω	0Ω	1 Meg.	0Ω	†68KΩ		
V 7	6V6GT	0Ω	.1Ω	†900Ω	†360Ω	470KΩ	†510Ω	0Ω	220Ω	
V 8	6V6GT	Inf.	.1Ω	†910Ω	†360Ω	470KΩ	Inf.	0Ω	220Ω	
V 9	7Z4	0Ω	Inf.	80Ω	Inf.	Inf.	80Ω	80KΩ	11Ω	

† MEASURED FROM PIN 7 OF V8

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning gang fully closed. Loosen the pointer adjust screw and set pointer in its horizontal position at the low frequency end of dial. Tighten pointer adjust screw. (DO NOT REMOVE THE NUT FROM FRONT OF POINTER).

AM ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (Grid) of 6BA7 (V2). Low side to chassis.	455KC (400 ∿ Mod.)	AM (fully CCW)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	.1MFD	"	1620KC	"	"	"	A5	"
3.		Loop	1400KC	"	Tune for max. output	"	A6, A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from Point A to chassis. The junction of these two resistors is alignment Point Ⓒ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.001MFD	High side to pin 7 (Grid) of 6BA7 (V2). Low side to chassis.	10.7MC (Unmod.)	FM (1st position CW)	Tuning gang fully open	DC Probe to Point Ⓐ. Common to chassis.	A8, A9, A10, A11, A12	Adjust for maximum deflection. Attenuate signal generator to maintain a maximum -5 volt reading.
5.	.001MFD	"	"	"	"	DC Probe to Point Ⓑ. Common to Point Ⓒ.	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	.001MFD	High side to pin 7 (Grid) of 6BA7 (V2). Low side to chassis.	10.7MC (450KC SWP)	FM (1st position CW)	Tuning gang fully open	Vert. Amp. to Point Ⓐ. Low side to chassis.	A8, A9, A10, A11, A12	Disconnect stabilizer capacitor C2. Adjust for maximum amplitude and symmetry as per fig. 1.
5.	.001MFD	"	"	"	"	Vert. Amp. to Point Ⓑ. Low side to chassis.	A13	Reconnect capacitor C2. Adjust A13 to place 10.7MC at center of crossover lines as per figure 2. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	270Ω carbon res.	High side thru 270Ω to "FM" antenna terminal (center terminal.) Low side to chassis.	87.5MC (Unmod.)	FM (1st position CW)	Tuning gang fully closed	DC Probe to Point Ⓐ. Common to chassis.	A14	Adjust for maximum deflection.
7.	Turn adjustment screws A15 and A16 counter-clockwise until cores are at the bottom of the pipe, then turn two turns clockwise.							
8.	270Ω carbon res.	High side thru 270Ω to "FM" antenna terminal (center terminal). Low side to chassis.	90MC	FM (1st position CW)	Tune for max. deflection.	DC Probe to Point Ⓐ. Common to chassis.	A17, A18	Adjust for maximum deflection.
9.	"	"	105MC	"	"	"	A15, A16	Adjust for maximum deflection. Repeat steps 8 and 9 until no further improvement can be made.

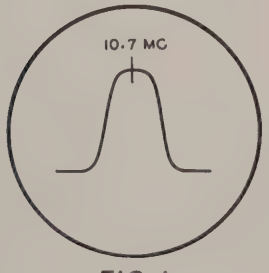


FIG. 1

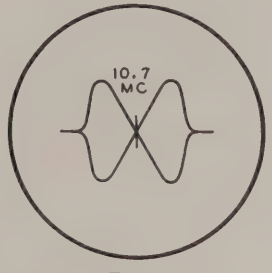


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	FM-AM RF Amp.	6AU6	6AU6	7BK	
V2	FM-AM Conv.	6BA7	6BA7	8CT	
V3	1st FM-AM IF Amp	6BA6	6BA6	7BK	
V4	2nd FM IF Amp.	6AU6	6AU6	7BK	
V5	Ratio Det.	6AL5	6AL5	6BT	
V6	DET.-AVC-AF	6AV6	6AV6	7BT	
V7	Power Output	6V6GT	6V6GT	7AC	
V8	Power Output	6V6GT	6V6GT	7AC	
V9	Rectifier	7Z4	7Z4	5AB	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

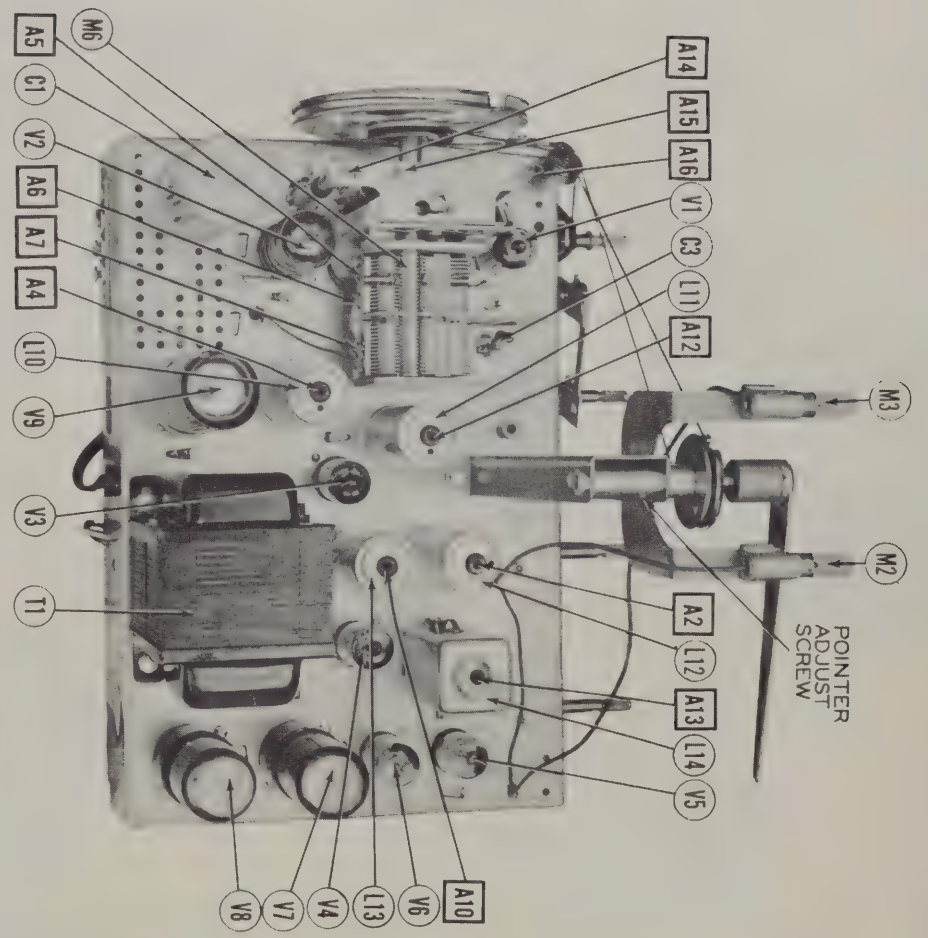
ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	300	23B690975	AFH888G4D		UPT44435		TVL-4605	▲ Filter
B	40	250		PRS25/25		C4		TVA-1205	■ Filter
C	40	250							▲ Filter
D	40	25							Output Cathode
C2	3	50	23K690543	PRS150/4		BR550		TVA-1301	Stabilizing Cap.
C3	220		21K77375	SI220	D6-221	5W5T25	GP2K-220	19C13	Ant. Coupling
C4	5		21K70720	SI5	TCZ-4.7	5W5V5	GP1K-5	MS-55	Ant. Coupling
C5	.05	200	8R9821	P288-05	DF-503	PTE4S5		2TM-S5	AVC Filter
C6	10000		21K482726	BPD-01	DD-103	PTE4S1	811-01	36C1	RF Amp. Screen
C7	100		21B77286	SI100	D6-101	5W5T1	GP1K-100	19C11	RF Amp. Cath.
C8	100		21B77286	SI100	D6-101	5W5T1	GP1K-100	19C11	RF Amp. Plate Dec.
C9	100		21B77286	SI100	D6-101	5W5T1	GP1K-100	19C11	RF Coupling
C100	100	500	21R6554	1469-0001	TCZ-100	5R5T1	NPOM-100	MS-31	RF Coupling
C11	24		21K28816	SI25	TCN-24	5W5Q25	N750K-25	19C26	Osc. Grid Cap.
C12	85		21K691203				N750K-85		Fixed Trimmer
C13	100		21B77286	SI100	D6-101	5W5T1	GP1K-100	19C11	Conv. Decoupling
C14	.01	400	8R9809	P488-01	D6-103	PTE4S1	811-01	4TM-S1	Conv. Decoupling
C15	1000		21K478410	SI1000	D6-102	1W5D1	GP2L-001	19C1	Conv. Fil. Bypass
C16	.005	600	8R9813	P688-005	D6-502	PTE6D5	811-005	6TM-D5	1st IF Dec.
C17	.01	400	8R9809	P488-01	D6-103	PTE4S1	811-01	4TM-S1	1st IF Fil. Byp.
C18	47		21K77373	SI37	D6-470	5W5Q5	GP1K-47	19C25	Diode RF Filter
C19	47		21K77373	SI47	D6-470	5W5Q5	GP1K-47	19C25	Diode RF Filter
C20	.002	400	8R9824	P688-002	D6-202	PTE6D2	GP2M-002	6TM-D2	2nd IF Decoupling
C21	10000		21K482726	BPD-01	D6-103	PTE4S1	811-01	36C1	2nd IF Cath.
C22	1000		21K478410	SI1000	D6-102	1W5D1	GP2L-001	19C1	RF Bypass
C23A	250		21B484337	SI250	D6-251	5W5T25	GP2K-250	1FM-325	Diode Load Cap. *
B	250			SI250	D6-251	5W5T25	GP2K-250	1FM-325	Diode Load Cap. *
C24	1000		21K478410	SI1000	D6-102	1W5D1	GP2L-001	19C1	De-emphasis
C25	.05	200	8R9821	P288-05	DF-503	PTE4S5		2TM-S5	Audio Coupling
C26	5000		21A470789	BPD-005	DD-502	PTE6D5	811-005	29C1	Audio Coupling
C27	220		21K77375	SI220	D6-221	5W5T25	GP2K-220	19C13	AF Amp. Plate
C28	.01	400	8R9809	P488-01	D6-103	PTE4S1	811-01	4TM-S1	Tone Compensation
C29	.005	600	8R9813	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Tone Compensation
C30	.05	400	8K470606	P488-05	DF-503	PTE4S5		4TM-S5	Audio Coupling
C31	.05	400	8K470606	P488-05	DF-503	PTE4S5		4TM-S5	Audio Coupling
C32	.005	600	8R9813	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Output Plate Byp.
C33	.005	600	8R9813	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Output Plate Byp.

* When either items C23A or C23B are replaced, replace both with capacitors of equal value.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	2 Meg.	½	18A600974	Q13-139X	AT-115	ANT-80	Volume control-tapped at 600KΩ
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SW-A	K-155	Attach to R1A per instructions
R2A	1 Meg.	½	18K77399	Q14-137	AG-61-S	AN-68	Tone control
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Attach to R2A per instructions

CHASSIS—TOP VIEW



SET 114

FOLDER 8

PHOTOFACT* Folder

PHILCO MODELS
50-T1104 (CODE 123), 50-T1400, 50-T1401,
50-T1402, 50-T1430 (CODE 121)

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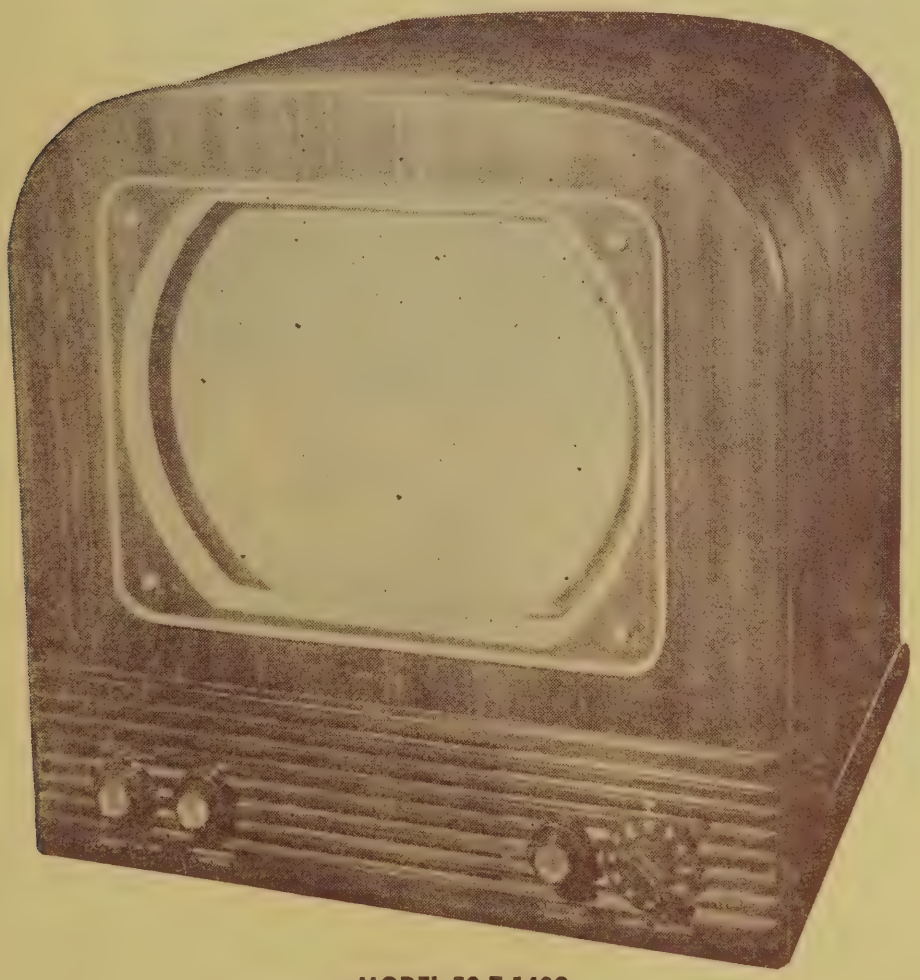

MODEL 50-T-1400

PHILCO MODELS
50-T1104 (CODE 123), 50-T1400, 50-T1401,
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Date 11/50 Set No. 114—Folder No. 9

PHOTOFACT* Folder
*TRADE MARK

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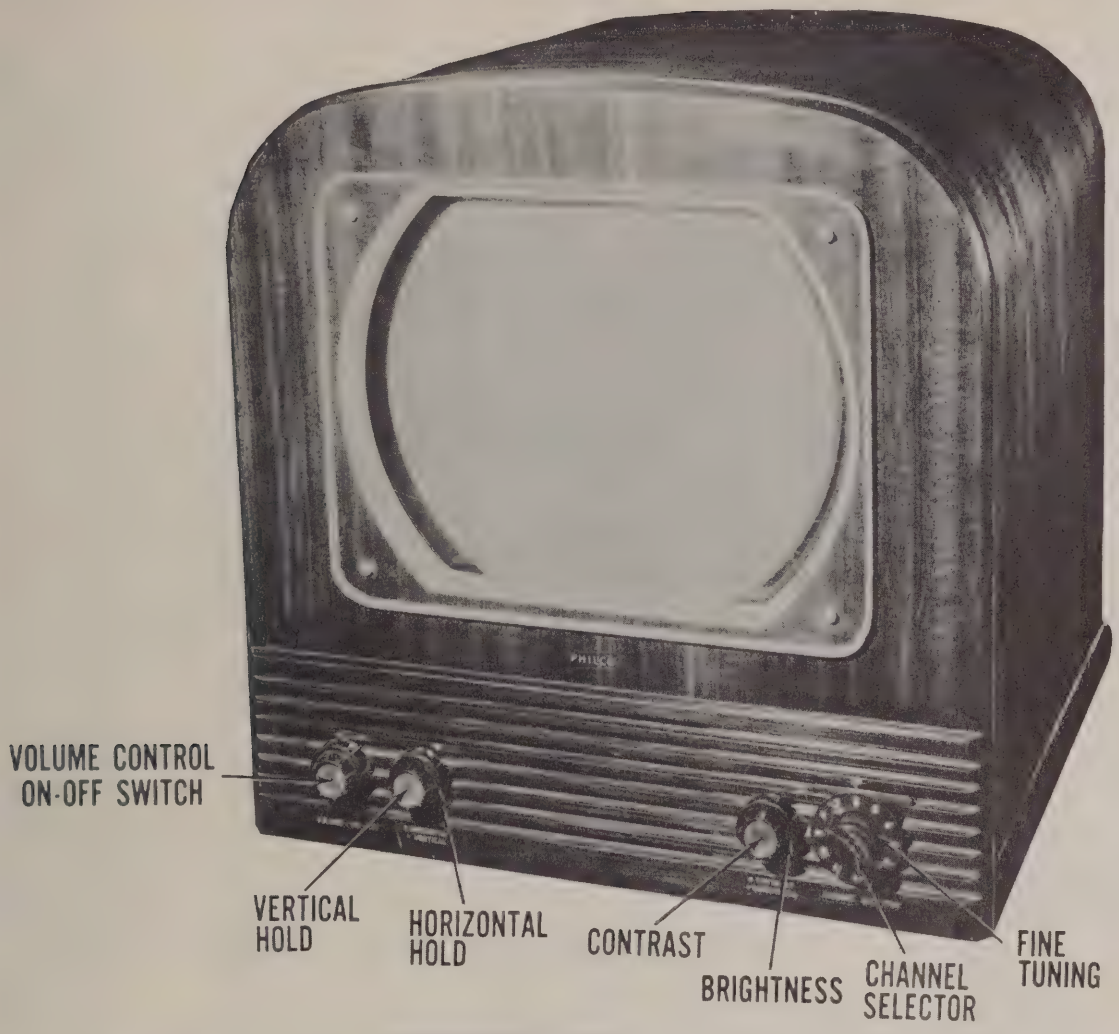
PHILCO MODELS 50-T1104 (Code 123), 50-T1400, 50-T1401, 50-T1402, 50-T1430 (Code 121)



PHILCO MODEL 50-T1400

TRADE NAME	Philco, Models 50-T1104 (Code 123), 50-T1400, 50-T1401, 50-T1402, 50-T1430 (All Code 121)
MANUFACTURER	Philco Corp., Tioga and "C" Sts., Philadelphia, Pa.
TYPE SET	Television Receiver
TUBES	Twenty Two
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATING	2.1 Amp. at 117 Volts AC
TUNING RANGE	Channels 2 thru 13

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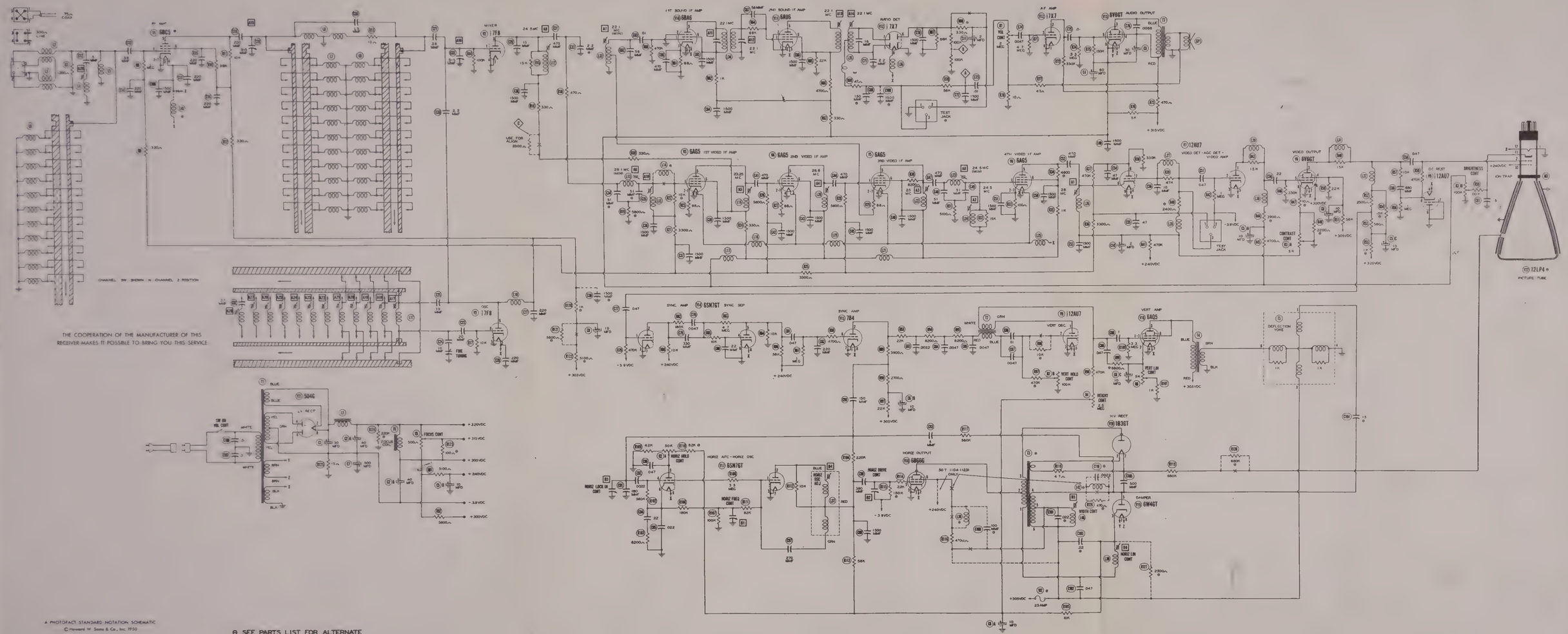

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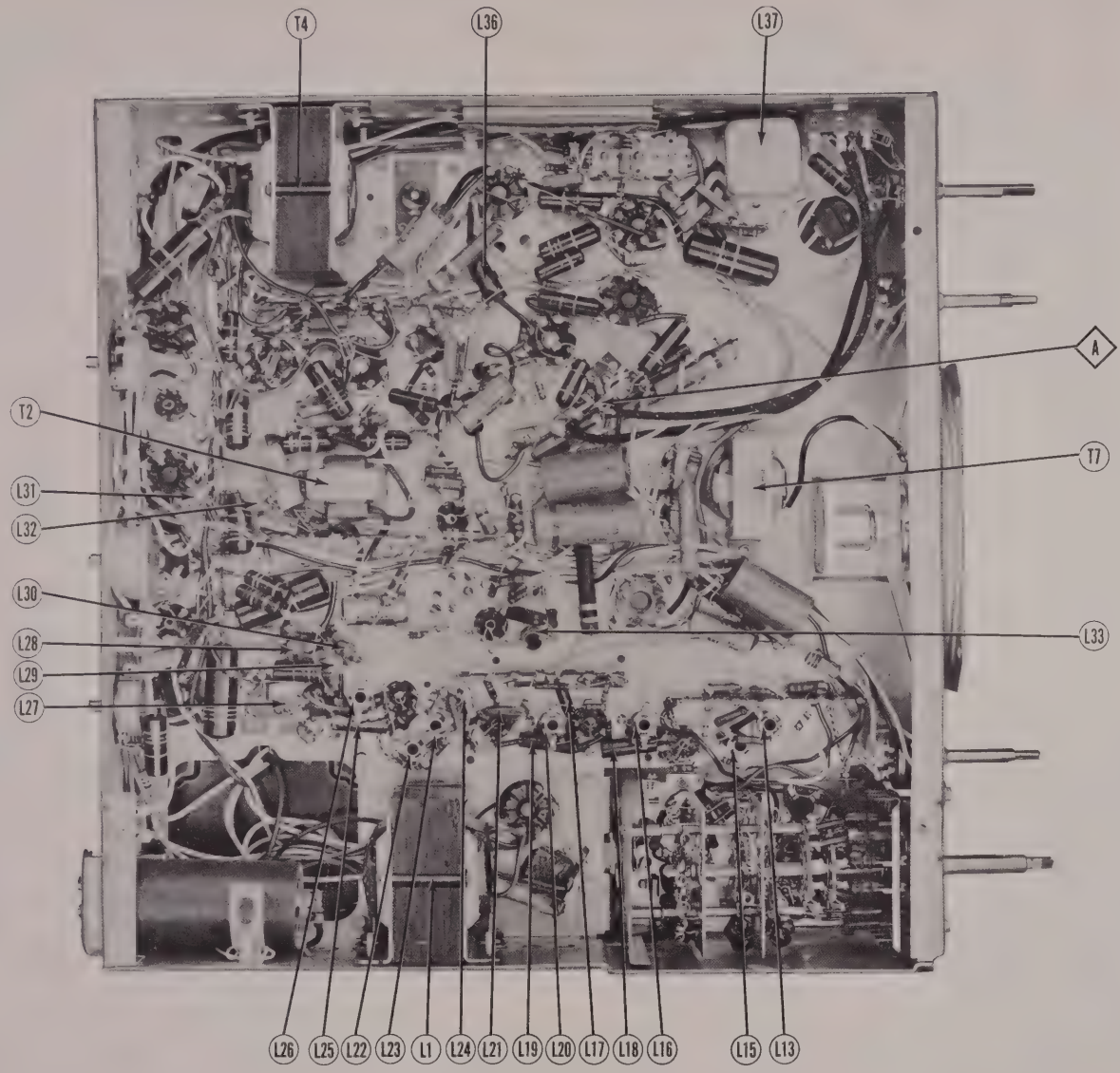
PHILCO MODELS 50-T1104 (Code 123), 50-T1400, 50-T1401, 50-T1402, 50-T1430 (Code 121)

CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

If receiver is to be aligned with picture tube removed the high voltage lead should be securely taped and dressed away from the chassis.

VIDEO IF ALIGNMENT

Disconnect the yellow lead at the junction of R12, C27 and L10 to prevent erroneous indications.
Turn the contrast control fully counter-clockwise.
Pre-set the following adjustments:
A11 and A12 fully clockwise
A10 fully counter-clockwise.
A8, A3 and A7 until the top of the adjusting screw is approximately 5/8 inch from top of coil mounting.
Connect the negative terminal of 1 1/2 volt battery to pin 2 of align test jack, connect the positive terminal to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.001MFD	High side to pin 1 (Grid) of 6AG5 (V6). Low side to chassis.	26MC (Unmod.)	Any	DC Probe to pin 3 of align test jack. Common to chassis.	A1	Adjust for maximum deflection.
2.	.001MFD	High side to pin 1 (Grid) of 6AG5 (V5). Low side to chassis.	24.5MC	"	"	A2	"
3.	.001MFD	"	25MC	"	"	A3	"
4.	.001MFD	High side to pin 1 (Grid) of 6AG5 (V4). Low side to chassis.	26.6MC	"	"	A4	"
5.	.001MFD	High side to pin 1 (Grid) of 6AG5 (V3). Low side to chassis.	23.25MC	"	"	A5	"
6.	Direct	High side to ungrounded tube shield floating over converter tube (V2). Low side to chassis.	28.1MC	3	"	A6	Adjust for MINIMUM deflection.
7.	Direct	"	22.1MC	"	"	A7, A8	Adjust A7 for MINIMUM deflection. If no reading apparent turn A7 until reading increases. Then adjust A7 to point where reading just begins to increase. Adjust A8 for MINIMUM deflection.
8.	Direct	"	24.5MC	"	"	A9	Adjust for maximum deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Direct	High side to ungrounded tube shield floating over converter tube (V2). Low side to chassis.	25MC (10MC SWP)	23.25MC 23.7MC 25.8MC 26.6MC	3	Vert. Amp. to Pin 3 of align test jack. Low side to chassis.	A10	Adjust for response curve similar to figure 1. The 23.25MC and 26.6MC markers should be at 50% response. If necessary, SLIGHTLY retouch A1 thru A5, A9 and A10 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors from pin 2 of FM test jack to chassis. The junction of these two resistors is alignment Point (B) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	Direct	High side to ungrounded tube shield floating over converter tube (V2). Low side to chassis.	22.1MC (Unmod.)	Any	DC Probe to pin 2 of FM test jack. Common to chassis.	A11, A12, A13	Adjust for maximum deflection.
11.	Direct	"	"	"	DC Probe to Point (A). Common to Point (B).	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Direct	High side to ungrounded tube shield floating over converter tube (V2). Low side to chassis.	22.1MC (450KC SWP)	22.1MC	Any	Vert. Amp. to pin 2 of "FM" test jack. Low side to chassis.	A11, A12, A13	Disconnect stabilizer capacitor C11. Adjust for maximum amplitude and symmetry as per figure 2.
11.	Direct	"	"	"	"	Vert. Amp. to Point (A). Low side to chassis.	A14	Reconnect capacitor C11. Adjust A14 to place 22.1MC at center of crossover lines as per figure 3. SLIGHTLY retouch A13 for maximum amplitude and straightness of crossover lines.

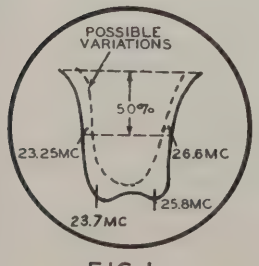


FIG. 1

FIG. 2

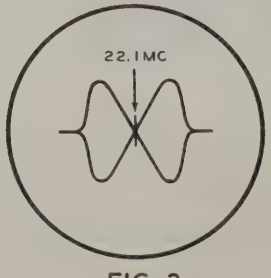


FIG. 3

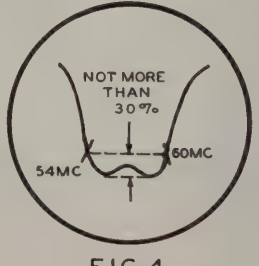


FIG. 4

ALIGNMENT INSTRUCTIONS (CONT.)

RF ALIGNMENT

Insert a piece of solder into hole adjacent to tuning core A9. Allow the solder to make contact with the lug under the hole and chassis.
Connect a 3300Ω resistor in series with 150 volt B+ lead to R16. The junction of these resistors will be alignment Point C.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	57MC (10MC SWP)	54MC 60MC	2	Vert. Amp. to Point C. Low side to chassis.	A15	Adjust for proper bandwidth of 6MC to 14MC as shown in figure 4 with markers as shown. The markers should not be less than 70% of maximum amplitude of response curve.
13.	"	"	213MC (10MC SWP)	Not used	13	"	A16	Adjust for maximum amplitude and symmetry as per figure 4.

OSCILLATOR ALIGNMENT

Reconnect the yellow lead to the junction of R12, C27 and L10.
The signal generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
14.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	59.75MC (Unmod.)	2	DC Probe to Point A. Common to Point B.	A17	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
15.	"	"	65.75MC	3	"	A18	"
			71.75MC	4		A19	
			81.75MC	5		A20	
			87.75MC	6		A21	
			179.75MC	7		A22	
			185.75MC	8		A23	
			191.75MC	9		A24	
			197.75MC	10		A25	
			203.75MC	11		A26	
			209.75MC	12		A27	
			215.75MC	13		A28	

FM TRAP ADJUSTMENT

The FM trap is adjusted at the factory to 100MC and normally should not be adjusted unless an FM station with a frequency other than 100MC causes interference.

Tune in the TV station which the FM interference occurs and adjust A29 for minimum interference.

If the FM station not on the air, connect an AM signal generator to the antenna terminals as in oscillator alignment, and set generator to frequency of FM station causing interference, and turn the channel selector to the channel on which interference occurs. Connect the vertical input lead of an oscilloscope to alignment Point C and chassis.

Adjust A29 for minimum indication on scope.

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

The horizontal hold control has sufficient range to compensate for normal variations and still provide horizontal synchronization. If replacement of tubes, or components, makes it necessary to make further adjustment, they should be made as follows:

1. Turn the horizontal frequency trimmer (B1) 1 1/2 turns counter-clockwise from fully clockwise position. Turn the horizontal drive trimmer (B2) two turns counter-clockwise from fully clockwise position. Turn the horizontal lock-in trimmer (B3) 1/2 turn counter-clockwise from fully clockwise position. Turn the horizontal hold control to the midposition of its range.
2. Turn the set on and tune in a TV station, preferably a test pattern, and adjust the horizontal oscillator coil slug (B4) until picture synchronizes horizontally.
3. Turn the horizontal hold control fully clockwise, and adjust B4 until 8 to 10 horizontal blanking bars are visible sloping downward to the right. If this cannot be accomplished, turn B1 another turn counter-clockwise and repeat this step.
4. Turn the hold control counter-clockwise until picture is in sync, and continue rotation of hold control until picture falls out of sync. The picture may not go out of sync, with the hold control at its fully counter-clockwise position. If this is true, momentarily remove the signal by switching to another channel and back again. The picture should be out of sync. Turn the hold control slowly clockwise and note the number of blanking bars present just before picture pulls into sync. There should be 3 1/2 to 4 1/2 bars present just before pull-in. If there are more than 4 1/2 bars, turn B3 1/4 turn clockwise and repeat steps 3 and 4. If there is less than 3 1/2 bars present, turn B3 another 1/4 turn counter-clockwise and repeat steps 3 and 4 until this condition exists.

HORIZONTAL WIDTH AND LINEARITY ADJUSTMENTS

Adjust the width slug (B5) until picture fills the mask horizontally.
Adjust the horizontal linearity slug (B6) until picture is symmetrical from left to right.

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	-.6VDC	0V	0V	6.3VAC	135VDC	125VDC	0V		
V 2	7F8	-1.6VDC	6.3VAC	130VDC	0V	0V	185VDC	0V	§-2.3VDC	
V 3	6AG5	-.5VDC	.4VDC	0V	6.3VAC	125VDC	125VDC	.4CDC		
V 4	6AG5	-.4VDC	.6VDC	6.3VAC	0V	130VDC	130VDC	.6VDC		
V 5	6AG5	-.4VDC	1.3VDC	6.3VAC	0V	130VDC	130VDC	1.3VDC		
V 6	6AG5	0V	1.3VDC	0V	6.3VAC	85VDC	135VDC	1.3VDC		
V 7	12AU7	105VDC	-.8VDC	0V	6.3VAC	6.3VAC	-2.8VDC	-1.4VDC	0V	0V
V 8	6V6GT	0V	6.3VAC	305VDC	85VDC	-1.7VDC	300VDC	0V	4.4VDC	
V 9	12AU7	275VDC 80VDC	-45VDC	0V	6.3VAC	6.3VAC	0V	0V	.6VDC	0V
V 10	6BA6	0V	0V	0V	6.3VAC	105VDC	105VDC	1.1VDC		
V 11	6AU6	-.4VDC	0V	6.3VAC	0V	90VDC	90VDC	0V		
V 12	7X7	0V	115VDC	-.6VDC	0V	-.4VDC	-20VDC	-.4VDC	6.3VAC	
V 13	6V6GT	0V	#6.3VAC	#150VDC	#165VDC	#-4.7VDC	0V	#0V	130VDC	
V 14	6SN7GT	-1.3VDC	165VDC	0V	-.3VDC	25VDC	0V	0V	6.3VAC	
V 15	7B4	0V	185VDC	180VDC	1.6VDC	0V	.4VDC	0V	6.3VAC	
V 16	6AQ5	0V	22VDC 36VDC	6.3VAC	0V	300VDC	300VDC	0V		
V 17	6SN7GT	-80VDC	200VDC	0V	-4VDC	45VDC	-25VDC	0V	6.3VAC	
V 18	6BG6G	0V	6.3VAC	0V	240VDC	-11VDC	200VDC	0V	245VDC	TOP CAP *
V 19	6W4GT	0V	0V	380VDC	300VDC	300VDC	340VDC	#0V	#6.3VAC	
V 20	1B3GT	* DO NOT MEASURE								
V 21	5U4G	0V	330VDC	0V	350VAC	0V	350VAC	130VDC	330VDC	
V 22	12LP4A	0V	.3VDC	PIN 10 240VDC	PIN 11 130VDC	PIN 12 6.3VAC				

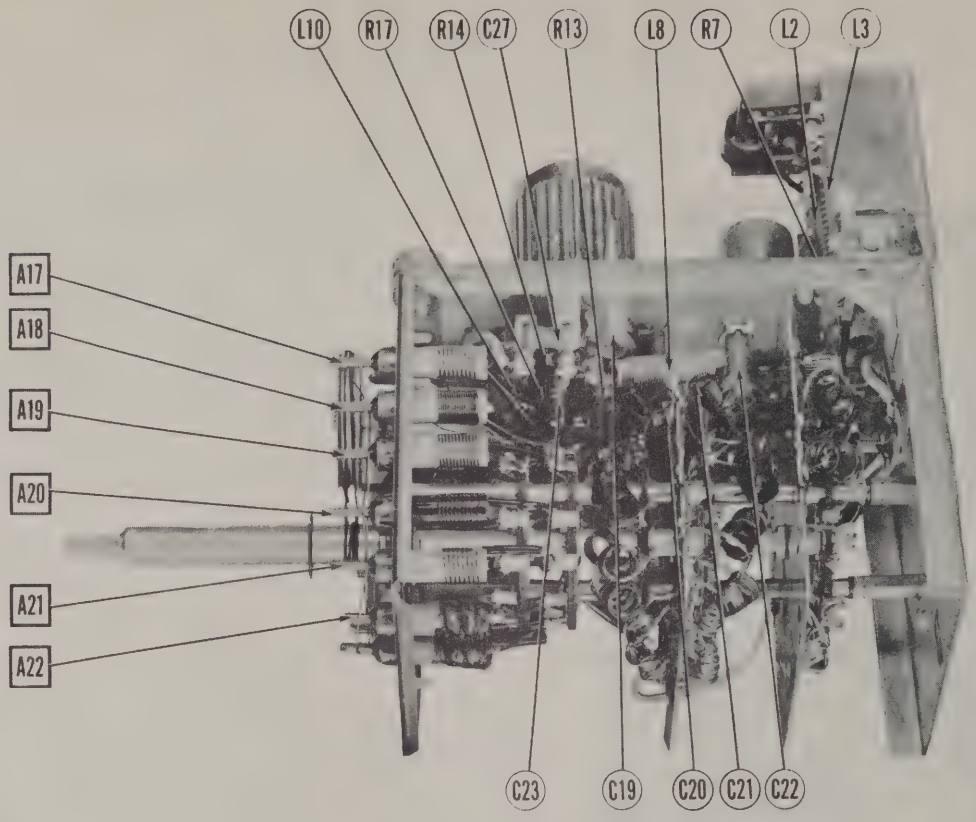
§ TAKEN WITH VACUUM TUBE VOLTMETER
# MEASURED FROM PIN 8 OF V13.
* DO NOT MEASURE

RESISTANCE READINGS

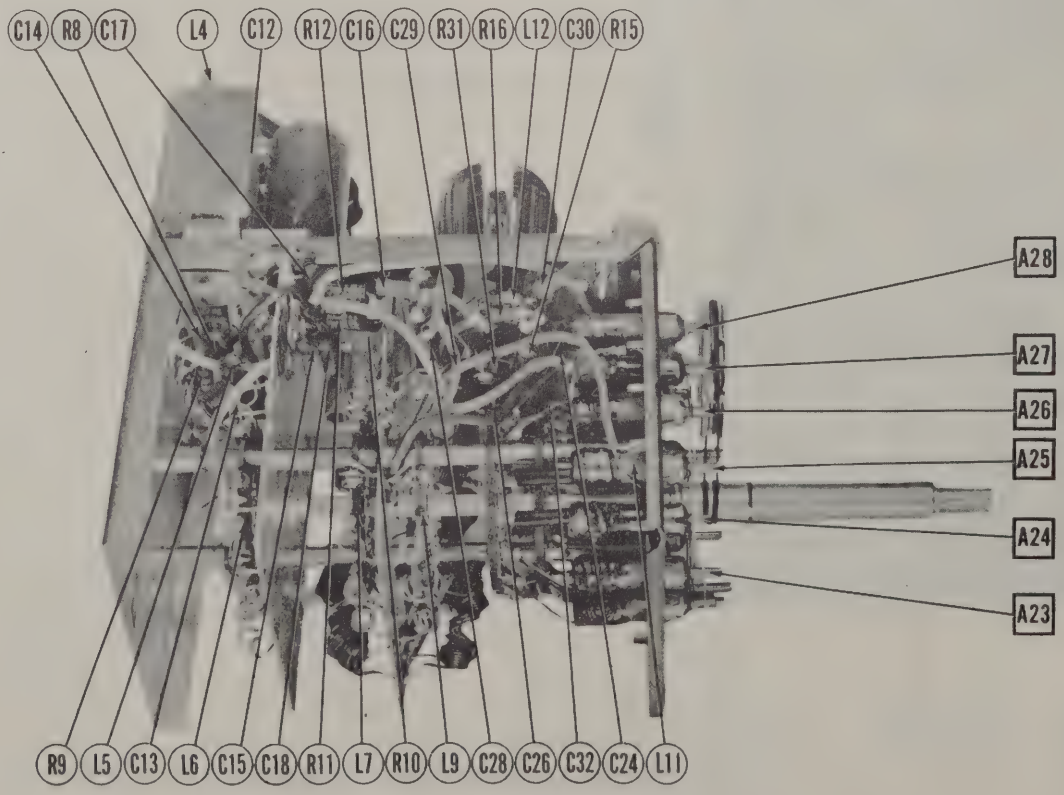
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	1.9 Meg.	0Ω	0Ω	.1Ω	†17KΩ	†46KΩ	0Ω		
V 2	7F8	100KΩ	.1Ω	#990Ω	0Ω	0Ω	†6.5KΩ	0Ω	10KΩ	
V 3	6AG5	850KΩ	68Ω	0Ω	.2Ω	#330Ω	#330Ω	68Ω		
V 4	6AG5	850KΩ	68Ω	.2Ω	0Ω	#.5Ω	#.2Ω	68Ω		
V 5	6AG5	850KΩ	68Ω	.2Ω	0Ω	#.5Ω	#.4Ω	68Ω		
V 6	6AG5	.3Ω	100Ω	0Ω	.2Ω	#5.6KΩ	#1KΩ	100Ω		
V 7	12AU7	#8.6KΩ	1 Meg.	0Ω	.1Ω	.1Ω	330KΩ	2.4KΩ	.3Ω	0Ω
V 8	6V6GT	Inf.	.1Ω	†3.7KΩ	†20KΩ	330KΩ	†6KΩ	0Ω	2KΩ	
V 9	12AU7	▲480KΩ ▲3 Meg.	470KΩ	0Ω	.1Ω	.1Ω	0Ω	0Ω	1 Meg.	0Ω
V 10	6BA6	470KΩ	0Ω	0Ω	.1Ω	#1.3KΩ	#1.3KΩ	68Ω		
V 11	6AU6	68KΩ	0Ω	.1Ω	0Ω	#4.5KΩ	#4.5KΩ	0Ω		
V 12	7X7	0Ω	†330KΩ	4.7 Meg.	0Ω	Inf.	68KΩ	Inf.	.2Ω	
V 13	6V6GT	Inf.	#.1Ω	†975Ω	†550Ω	#150KΩ	Inf.	#10Ω	†5KΩ	
V 14	6SN7GT	470KΩ	†15KΩ	0Ω	4.7 Meg.	†20KΩ	0Ω	0Ω	.1Ω	
V 15	7B4	0Ω	†28KΩ	†45KΩ	1 Meg.	9Ω	1 Meg.	0Ω	.1Ω	
V 16	6AQ5	3.3 Meg.	6KΩ 1KΩ	.1Ω	0Ω	†900Ω	†900Ω	3.3 Meg.		
V 17	6SN7GT	180KΩ	▲65KΩ	0Ω	700KΩ	▲140KΩ	270KΩ	0Ω	.1Ω	
V 18	6BG6G	Inf.	.1Ω	0Ω	†5KΩ	200KΩ	▲55KΩ	0Ω	†4.8KΩ	TOP CAP ▲100Ω
V 19	6W4GT	Inf.	Inf.	140KΩ	†120Ω	†150Ω	▲10KΩ	#0Ω	#.1Ω	
V 20	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP ▲510Ω
V 21	5U4G	Inf.	20KΩ	Inf.	25Ω	Inf.	25Ω	†4.7KΩ	20KΩ	
V 22	12LP4	0Ω	1.5 Meg.	PIN 10 †5.2KΩ	PIN 11 120KΩ	PIN 12 .1Ω				

MEASURED FROM PIN 8 OF V13
† MEASURED FROM PIN 8 OF V21
▲ MEASURED FROM PIN 3 OF V19

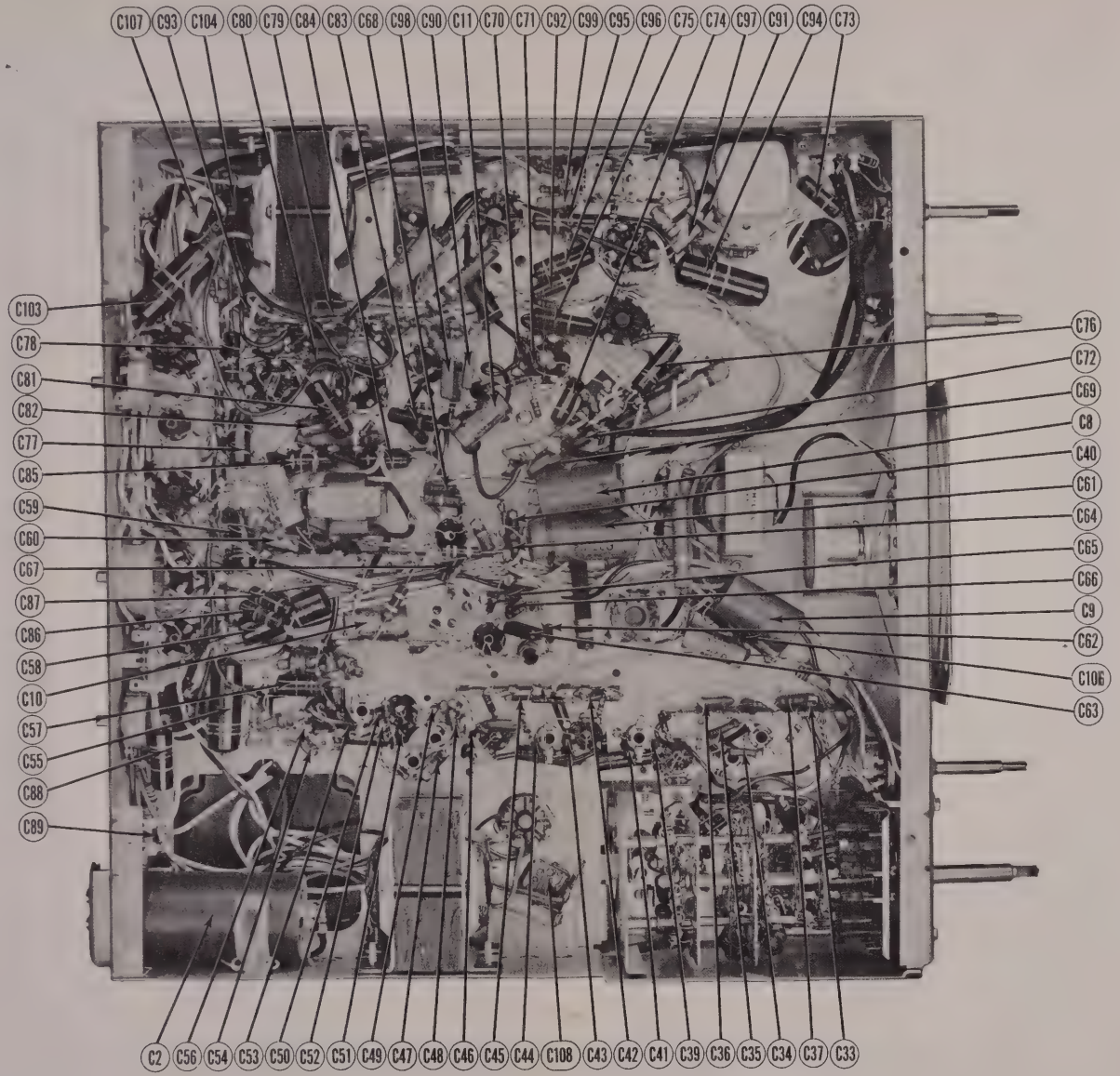
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



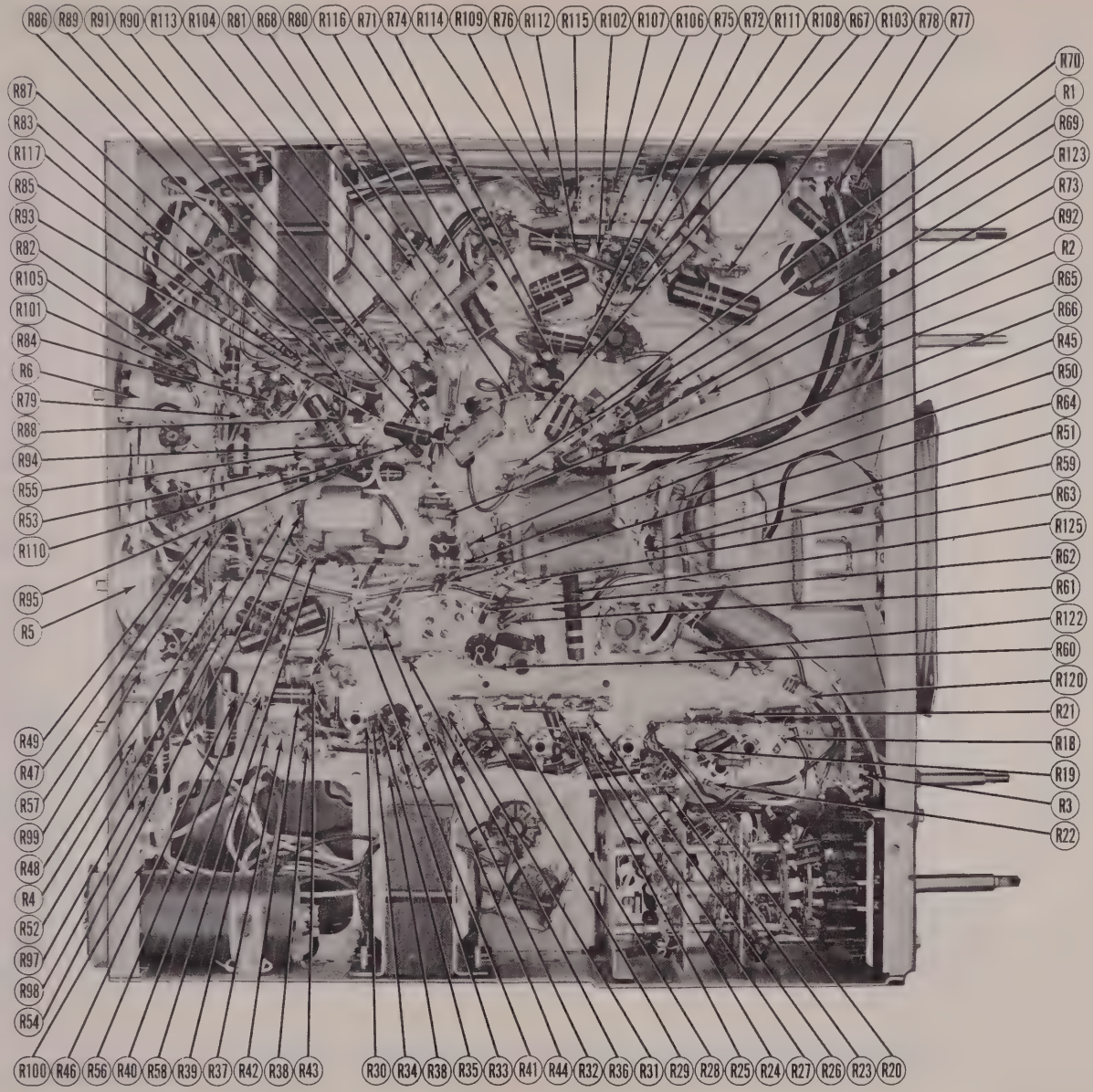
RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		PHILCO PART No.	STANDARD REPLACEMENT		
V1A	RF Amp.	6BC5	6BC5	7BD	
B	RF Amp.	6AG5	6AG5	7BD	
V2	Converter	7F8	7F8	8G	
V3	1st Video IF	6AG5	6AG5	7BD	
V4	2nd Video IF	6AG5	6AG5	7BD	
V5	3rd Video IF	6AG5	6AG5	7BD	
V6	4th Video IF	6AG5	6AG5	7BD	
V7	Video Det. -AGC Det. -Video Amp.	12AU7	12AU7	9A	
V8	Video Det.	6V6GT	6V6GT	7AC	
V9	DC Rest. -Vert. Osc.	12AU7	12AU7	9A	
V10	1st Sound IF	6BA6	6BA6	7BK	
V11	2nd Sound IF	6AU6	6AU6	7BK	
V12	Ratio Det. -AF Amp.	7X7	7X7	8BZ	
V13	Audio Output	6V6GT	6V6GT	7AC	
V14	Sync. Amp. -Sync. Sep.	6SN7GT	6SN7GT	8BD	
V15	Sync. Amp.	7B4	7B4	5AC	
V16	Vert. Amp.	6AQ5	6AQ5	7BZ	
V17	Hor. AFC-Hor. Osc.	6SN7GT	6SN7GT	8BD	
V18	Hor. Output	6BG6G	6BG6G	5BT	
V19	Damper	6W4GT	6W4GT	4CG	
V20	HV Rect.	1B3GT	1B3GT	3C	
V21	LV Rect.	5U4G	5U4G	5T	
V22A	Picture Tube	12LP4	12LP4	12D	
B	Picture Tube	10BP4	10BP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1	30	475	30-2568-19	AF6X		UPE3050		TVL-1810	Filter
C2A	40	450	30-2570-13	AF88J		UP4445		TVL-2764	▲ Filter
B	40	450							▲ Filter
C3	30	475	30-2568-19	AF6X		UPE3050		TVL-1810	Decoupling
C4	80	450	30-2570-39	AF16J		UP8045			Decoupling
C5A	10	475	30-2570-13	AF222X		UP11150		TVL-3835	■ 1st V. Amp. Dec.
B	10	475							▲ Decoupling
C	10	475							V. Output Dec.
C6A	10	475	30-2570-13	AF222X		UP11150		TVL-3835	■ Decoupling
B	10	475							▲ Sync. Amp. Dec.
C	10	475							Vert. Output Cath.
C7	500	25	30-1229-2	E3A172		UPT103			Filter
C8	10	450	30-2417-6	PRS450/10		BR1045A		TVA-1705	V. Output Screen
C9	10	450	30-2417-6	PRS450/10		BR1045A		TVA-1705	Decoupling
C10	2	50	30-2417-7	E26E6		BBR2-50T		TVA-1301	Bias Filter
C11	2	50	30-2417-7	E26E6		BBR2-50T		TVA-1301	Stabilizing Cap.
C12	5			SI5NPO	TCZ-4.7		NPOK-5		Fixed Trimmer
C13	39			SI39	D6-390		GPIK-39		RF Coupling
C14	220			SI220	D6-221		GP2K-220	19C13	AGC Filter
C15	220			SI220	D6-221		GP2K-220	19C13	RF Screen
C16	220			SI220	D6-221		GP2K-220	19C13	RF Decoupling
C17	220			SI220	D6-221		GP2K-220	19C13	RF Fil. Bypass
C18	220			SI220	D6-221		GP2K-220	19C13	RF Coupling
C19	.5-5						532-08-.5-5		Variable Trimmer
C20	1.5			SI1, 5NPO	TCZ-1.5		NPOK-1.5		RF Coupling
C21	39			SI39	D6-390		GPIK-39		RF Coupling
C22	.5-5						532-08-.5-5		Variable Trimmer
C23	20			SI20	TCZ-20		GPIK-20		Osc. Grid Cap.
C24	10								Fixed Trimmer
C25	39			SI39	D6-390		GPIK-39		Osc. Feedback
C26	2.2				TCZ-2.2				Osc. Coupling
C27	220			SI220	D6-221		GP2K-220	19C13	RF Bypass
C28	220			SI220	D6-221		GP2K-220	19C13	Conv. Fil. Bypass
C29	15			SI15	D6-150		GPIK-15	19C22	Fixed Trimmer
C30	1500			SI1500	D6-152		GP2L-0015	29C8	Conv. Plate Dec.
C31	470			SI470	D6-471		GP2K-470	19C15	IF Coupling
C32	27			SI27	D6-270		GPIK-27		Fixed Padder
C33	2.2		30-1221-4		TCZ-2.2				RF Bypass *
C34	51		30-1224-62	SI51	D6-510		GPIK-51		Fixed Trimmer ♦
C35	51		30-1224-62	SI51	D6-510		GPIK-51		Fixed Trimmer ♦
C36	1500		62-215001011	SI1500	D6-152	1W5D15	GP2L-0015	29C8	AGC Filter
C37	1500		62-215001011	SI1500	D6-152	1W5D15	GP2L-0015	29C8	AGC Filter
C38	1500		62-215001011	SI1500	D6-152	1W5D15	GP2L-0015	29C8	RF Bypass
C39	1500		62-215001011	SI1500	D6-152	1W5D15	GP2L-0015	29C8	1st V. IF Dec.
C40	1500		62-215001011	SI1500	D6-152	1W5D15	GP2L-0015	29C8	RF Bypass
C41	470		62-147001001	SI470	D6-471	5W5T5	GP2K-470	19C15	IF Coupling
C42	1500		62-215001011	SI1500	D6-152	1W5D15		29C8	AGC Filter
C43	1500		62-215001011	SI1500	D6-152	1W5D15		29C8	2nd V. IF Dec.
C44	470		62-417001001	SI470	D6-471	5W5T5		19C15	IF Coupling
C45	1500		62-215001011	SI1500	D6-152	1W5D15		29C8	AGC Filter
C46	1500		62-215001011	SI1500	D6-152	1W5D15		29C8	3rd V. IF Dec.
C47	470		62-147001001	SI470	D6-471	5W5T5		19C15	IF Coupling
C48	51		62-1224-2	SI51	D6-510		GPIK-51		Fixed Trimmer
C49	51		62-1224-2	SI51	D6-510		GPIK-51		Fixed Trimmer
C50	1500		62-215001011	SI1500	D6-152	1W5D15	GP2L-0015	29C8	4th V. IF Dec.
C51	1500		62-215001011	SI1500	D6-152	1W5D15	GP2L-0015	29C8	4th V. IF Cath.
C52	470		62-147001001	SI470	D6-471	5W5T5	GP2K-470	19C15	IF Coupling
C53	1500		62-215001011	SI1500	D6-152	1W5D15	GP2L-0015	29C8	RF Bypass
C54	47		30-1224-2	SI47	D6-470	5W5Q5	GPIK-47	19C25	V. Det. -AGC Plate
C55	.47	200	61-0133	P288-47		GT2P5			AGC Filter
C56	10		62-010009001	SI10	D6-100	5W5Q1	GPIK-10	19C19	V. Diode Filter
C57	.047	400	61-0122	P488-047	DF-503	PTE4S5		4TM-S47	Video Coupling
C58	.22	400	45-3505-49	P488-22		GT4P25		4TM-P22	Video Coupling
C59	.047	400	61-0122	P488-047	DF-503	PTE4S5		4TM-S47	Video Coupling
C60	680	500	60-10685401	SI680	D6-681	1W5T7	GP2K-680	19C17	Video Coupling
C61	.5	400	61-0133	684-5		GT4P5		4TM-P5	Pic. Tube Cath.
C62	56		62-056409001	SI56	D6-560		GPIK-56		Fixed Trimmer

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C63	.01	100	61-0120	P488-01	D6-103	PTE4S1	811-01	4TM-S1	S. IF Coupling
C64	1500		62-21500101	SII500	D6-152	1WSD15	GP2L-0015	29C8	RF Bypass
C65	1500		62-21500101	SII500	D6-152	1WSD15	GP2L-0015	29C8	1st S. IF Dec.
C66	470		62-14700100	SI470	D6-471	5WST5	GP2K-470	19C15	1st S. IF Cath.
C67	56		62-05640901	SI56	D6-560	5WSQ6	GP1K-56	19C28	S. IF Coupling
C68	1500		62-21500101	SII500	D6-152	1WSD15	GP2L-0015	29C8	2nd S. IF Dec.
C69	150	500	60-10155407	1468-00015	D6 151	5WST15	GP2K-150	1FM-315	Diode Load Cap. †
C70	1500		62 21500101	SII500	D6-152	1WSD15	GP2L-0015	29C8	RF Bypass
C71	2 2		30-1221-4		TCZ 2 2				Balancing
C72	1500		62-21500101	SII500	D6-152	1WSD15	GP2L-0015	29C8	De-emphasis
C73	.01	400	61-0120	P488-01	D6-103	PTE4S1	811-01	4TM-S1	Audio Coupling
C74	.0047	600	45-3505-58	P688-0047	D6-472	PTE6D5	GP2M-0047	6TM-D47	Audio Coupling
C75	.01	600	61-0120	P688-01	D6-103	PTE6S1	811-01	6TM-S1	Audio Coupling
C76	.0068	1000	45-3505-91	P1088-0068		PTE16D7			Output Plate Byp.
C77	.047	400	61-0122	P488-047	DF-503	PTE4S5		4TM-S47	Sync. Coupling
C78	.0047	600	45-3505-56	P688-0047	D6-472	PTE6D5	GP2M-0047	6TM-D47	Sync. Coupling
C79	330	500	63-13300100I	1468-00035	D6-331	5WST3	GP2K-330	1FM-335	Sync. Coupling
C80	22	500	62-02209001	1468-000025	D6-220	5WSQ25	GP1K-23	MS-425	Sync. Sep. Grid Byp.
C81	.047	400	45-3505-62	P488-047	DF-503	PTE4S5		4TM-S47	Sync. Coupling
C82	220	500	62-12200100I	1468-00025	D6-221	5WST25	GP2K-220	1FM-325	Sync. Amp. Grid
C83	.0022	600	61-0062	P688-0022	D6-222	PTE6D2	GP2M-0022	6TM-D22	Integrator Net.
C84	.0047	600	45-3505-58	P688-0047	D6-472	PTE6D5	GP2M-0047	6TM-D47	Integrator Net.
C85	.0047	600	45-3505-56	P688-0047	D6-472	PTE6D5	GP2M-0047	6TM-D47	Integrator Net.
C86	.01	400	61-0120	P488-01	D6-103	PTE4S1	811-01	4TM-S1	Vert. Sync. Coupling
C87	.0047	600	45-3505-56	P688-0047	D6-472	PTE6D5	GP2M-0047	6TM-D47	Vert. Sync. Coupling
C88	.047	400	45-3505-62	P488-047		PTE4S5		4TM-S47	Vert. Discharge
C89	1	400	45-3505-64	P488-1	DF-104	PTE4P1		4TM-P1	Vert. Sweep Coupling
C90	150	500	60-10155407	1468-00015	D6-151	5WST15	GP2K-150	1FM-315	Hor. Sync. Coupling
C91	180	500	30-1220-30	1468-0002	D6-181	5WST3	GP2K-180	1FM-32	Voltage Divider
C92	.0022	600	61-0062	P688-0022	D6-222	PTE6D2	GP2M-0022	6TM-D22	Hor. Sync. Coupling
C93	5	500	60-30505007	1468-000005	TCZ-4.7	5W5V5	GP1K-5	MS-55	Hor. Feedback
C94	22	400	61-0125	P488-22		GT4P25		4TM-P22	AFC Filter
C95	.022	400	61-0108	P488-022	DF-203	PTE4S2		4TM-S22	AFC Filter
C96	.047	400	61-1070	P488-047	DF-503	PTE4S5		4TM-S47	Hor. AFC Plate
C97	270	500	60-10275407	1468-00025	D6-271	5WST25	GP2K-270	1FM-325	Hor. Osc. Grid
C98	1500	500	60-20155404	1464-0015		1R5D15	GP2L-0015	MS-215	Fixed Trimmer
C99	390	500	60-10395407	1468-0004	D6-391	5WST4	GP2K-390	1FM-34	Hor. Sweep Coupling
C100	100		60-10105407						Hor. Feedback *
C101	.022	600	45-3505-60	P688-022	DF-203	PTE6S2		6TM-S22	Fixed Trimmer *
C102	.047	400	61-0122	P488-047		PTE4S5		4TM-S47	Damper Filter
C103	22	400	45-3505-49	P488-22		GT4P25		4TM-P22	Damper Filter ¶
C104	15	200	45-3505-48	P288-15		GT4P2		2TM-P15	Hor. Sweep Coup. See Note 1
C105	500	20000	30-1229-2	HV20B	TV1-502				HV Filter
C106	1500		60-21500101I	SII500	D6-152	1WSD15	GP2L-0015	29C8	Filament Bypass
C107	.01	600	61-0120	P688-01	D6-103	PTE6S1	811-01	6TM-S1	Line Filter
C108	.01	600	61-0120	P688-01	D6-103	PTE6S1	811-01	6TM-S1	Line Filter
C109	1500		60-21500101	SII500	D6-152	1WSD15	GP2L-0015	29C8	Diode Load Cap. †
C110	.0022	600	45-3505-54	P688-0022	D6-222	PTE6D2	GP2M-0022	6TM-D22	Fixed Trimmer §

* Not used in all models.
† Used only in models 50T-1400, 50T1401, 50T-1402, and 50T-1430 after run 4.
‡ Not used in models 50T-1400, 50T-1401, 50T-1402 and 50T-1430 after run 4.
§ Used only in model 50T-1104 code 123 after run 2.
• Model 50T1104 code 123 used 18MMF in this application before run 4.
¶ Model 50T1104 code 123 used .082MFD in this application Mfgr's Part No. 30-4651-3.
Note 1. Model 50T1104 code 123 uses .47MFD in this application Mfgr's Part No. 61-0133.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	2 Meg.	½	33-5564-4	Q13-139	AG-66-Z	B-76-S	Volume control
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R1A per instructions
R2A	50KΩ	½	Concentrikit	Q11-123 *			Horiz. hold control-front
B	100KΩ	½	33-5563-6	Q11-128 *	RTV-133		Vert. hold control-rear
C	Shaft-End			E-202 *			Attach per instr. in "Concentrikit".
R3A	5000Ω	2	33-5563-10		RTV-132	SBB-566	Contrast control-Wire Wound-front
B	100KΩ	½					Brightness control-rear
R4A	2 5 Meg.	½	33-5565-10	Q11-239	AM-84-S	AN-83	Height control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R4A per instructions
R5	500Ω	4	33-5546-28		RTV-126	SVP-985	Focus control-Wire Wound
R6A	5000Ω	2	33-5564-10	Q11-114	AM-19-S	AN-10	Vert. linearity control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R6A per instructions

* Additional parts to be used with "Concentrikit".

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R7	1200Ω	½		BTS-1200	Antenna Loading
R8	1 Meg. 20%	½			RF Amp. Grid
R9	330Ω 20%	½		BTS-330	AGC Network
R10	39KΩ	½			RF Amp. Screen
R11	10KΩ	1			RF Amp. Plate
R12	330Ω 20%	½		BTS-330	RF Amp. Decoupling
R13	10Ω	½			Parasitic Suppressor
R14	100KΩ	½			Mixer Grid
R15	15KΩ	½			Mixer Plate Coil Shunt
R16	330Ω 20%	½		BTS-330	Mixer Plate Decoupling
R17	10KΩ	½			Osc. Grid
R18	470Ω	½	66-1478340		Parasitic Suppressor
R19	5600Ω 5%	½	66-2568340	BTS-5600-5%	Trap Network-See Note 1
R20	330Ω	½	66-1338340	BTS-330	Decoupling
R21	3300Ω 20%	½	66-2338340	BTS-3300	AGC Network
R22	10KΩ	½	66-3108340		1st Video IF Amp. Grid-See Note 2
R23	68Ω	½	66-0688340		1st Video IF Amp. Cathode
R24	330Ω	½	66-1338340	BTS-330	1st Video IF Amp. Decoupling
R25	3300Ω 20%	½	66-2338340	BTS-3300	AGC Network
R26	5600Ω	½	66-2568340	BTS-5600	2nd Video IF Amp. Grid

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	IDENTIFICATION CODES
R27	68Ω	½	66-0688340		2nd Video IF Amp. Cathode
R28	5600Ω	½	66-2568340	BTS-5600	3rd Video IF Amp. Grid
R29	68Ω	½	66-0688340		3rd Video IF Amp. Cathode
R30	8200Ω	½	66-2828340		3rd Video IF Plate Coil Shunt
R31	5100Ω 5%	½	66-2508340		Trap Network
R32	15KΩ	½	66-3158340		4th Video IF Amp. Grid Coil Shunt
R33	100Ω	½	66-1108340	BTS-100	4th Video IF Amp. Cathode-Wire Wound
R34	4600Ω	½	66-2468340	BTS-4700	4th Video IF Amp. Plate-See Note 3
R35	1000Ω	½	66-2108340	BTS-1000	4th Video IF Amp. Decoupling
R36	3300Ω 20%	½	66-2338340	BTS-3300	AGC Network
R37	470KΩ	½	66-4478340	BTS-470K	AGC Network
R38	330KΩ	½	66-4338340	BTS-330K	AGC Diode Load
R39	47KΩ	½	66-3478340	BTS-47K	Video Peaking Coil Shunt
R40	2400Ω 5%	½	66-2248340		Video Det. Diode Load-See Note 4
R41	470KΩ	½	66-4478340	BTS-470K	Voltage Divider
R42	1 Meg. 20%	½	66-5108340	BTS-1 Meg.	Video Amp. Grid
R43	15KΩ	½	66-3158340	BTS-15K	Video Peaking Coil Shunt
R44	3900Ω	1	66-2398340	BTA-3900	Video Amp. Plate-See Note 5
R45	4700Ω	1	66-2478340	BTA-4700	Video Amp. Plate Decoupling
R46	330KΩ	½	66-4338340	BTS-330K	Video Output Grid
R47	10Ω		66-0108340	BW-½-10	Video Output Cathode
R48	2200Ω	½	66-2228340	BTS-2200	Voltage Divider-See Note 7
R49	15KΩ	½	66-3158340	BTS-15K	Video Peaking Coil Shunt
R50	22KΩ	1	66-3228340	BTA-22K	Voltage Divider
R51	56KΩ	2	66-3564340	BTS-56K	Video Output Screen
R52	2500Ω	5	66-2254340	1 3/4A-2500	Video Output Plate-Wire Wound
R53	560Ω	1	66-1564340	BTA-560	Video Output Plate
R54	10KΩ	½	66-3108340	BTS-10K	Video Output Plate-See Note 8
R55	1000Ω	2	66-2108340	BTB-1000	Video Output Plate Decoupling-See Note 9
R56	1 Meg. 20%	½	66-5108340	BTS-1 Meg.	DC Rest. Load
R57	10KΩ	½	66-3108340	BTS-10K	Isolation
R58	470KΩ 20%	½	66-4478340	BTS-470K	Picture Tube Grid
R59	100KΩ 20%	½	66-4108340	BTS-100K	Voltage Divider
R60	470KΩ 20%	½	66-4478340	BTS-470K	1st Sound IF Amp. Grid
R61	68Ω	½	66-0688340		1st Sound IF Amp. Cathode
R62	1000Ω	½	66-2108340	BTS-1000	1st Sound IF Amp. Decoupling
R63	330Ω	½	66-1338340	BTS-330	Decoupling
R64	68KΩ 20%	½	66-3688340		2nd Sound IF Amp. Grid
R65	22KΩ	1	66-3228340		Voltage Divider
R66	4700Ω	1	66-2478340	BTA-4700	2nd Sound IF Amp. Decoupling
R67	68KΩ	½	66-3688340	BTS-68K	Ratio Det. Diode Load
R68	330Ω	½	66-1338340	BTS-330	Balancing-See Note 8
R69	47Ω	½	66-0478340	BW-½-47	Balancing
R70	56KΩ	½	66-3568340	BTS-56K	De-emphasis
R71	4.7 Meg. 20%	½	66-5478340	BTS-4.7 Meg.	AF Amp. Grid
R72	330KΩ	½	66-4338340	BTS-330K	AF Amp. Plate
R73	470Ω	2	66-1478340	BTB-470	Decoupling
R74	3.3 Meg.	½	66-5338340	BTS-3.3 Meg.	Audio Output Grid
R75	150KΩ	½	66-4158340	BTS-150K	Bias Network
R76	5000Ω	10	33-3435-30	1 3/4A-5000	Decoupling-Wire Wound
R77	47Ω	½	66-0478340	BW-½-47	Feedback
R78	10Ω	½	66-0108340	BW-½-10	Feedback
R79	470KΩ 20%	½	66-4478340	BTS-470K	Sync. Amp. Grid
R80	10KΩ	2	66-3104340	BTB-10K	Sync. Amp. Plate
R81	5100Ω	5	33-5546-28	1 3/4A-4700	Sync. Amp. Plate Decoupling- Wire Wound
R82	180KΩ	½	66-4188340	BTS-180K	Phase Shifting
R83	4.7 Meg.	½	66-5478340	BTS-4.7 Meg.	Sync. Sep. Grid
R84	10KΩ	½	66-3108340	BTS-10K	Voltage Divider
R85	10KΩ	½	66-3108340	BTS-10K	Isolation
R86	56KΩ	2	66-3564340	BTB-56K	Sync. Sep. Plate
R87	1 Meg.	½	66-5108340	BTS-1 Meg.	Sync. Amp. Grid
R88	4700Ω	½	66-2478340	BTS-4700	Sync. Amp. Grid
R89	3900Ω	½	66-2398340	BTS-3900	Sync. Amp. Plate
R90	2700Ω	½	66-2278340	BTS-2700	Sync. Amp. Plate Decoupling
R91	22KΩ	1	66-3228340	BTA-22K	Filter
R92	5600Ω	2	66-2568340	BTB-5600	Filter
R93	22KΩ	½	66-3228340	BTS-22K	Integrator
R94	8200Ω	½	66-2828340	BTS-8200	Integrator
R95	8200Ω	½	66-2828340	BTS-8200	Integrator
R96	10KΩ	½	66-3108340	BTS-10K	Vert. Osc. Grid-See Note 10
R97	470KΩ	½	66-4478340	BTS-470K	Vert. Osc. Grid-See Note 11
R98	470KΩ	½	66-4478340	BTS-470K	Vert. Osc. Plate
R99	6800Ω	½	66-2688340	BTS-6800	Vert. Peaking-See Note 12
R100	3.3 Meg.	½	66-5338340	BTS-3.3 Meg.	Vert. Output Grid
R101	1000Ω	½	66-2108340	BTS-1000	Vert. Output Cathode
R102	560KΩ	½	66-4568340	BTS-560K	Horiz. AFC Grid
R103	8200Ω	½	66-2828340	BTS-8200	Horiz. AFC Filter Network
R104	220KΩ	½	66-4228340	BTS-220K	Horiz. AFC Filter Network
R105	10KΩ	½	66-3108340	BTS-10K	Filter
R106	180KΩ	½	66-4188340	BTS-180K	Horiz. AFC Cathode
R107	100KΩ 5%	1	66-4108340	BTA-100K-5%	Horiz. AFC Cathode
R108	3.3 Meg. 5%	1	66-5338340	BTS-3.3 Meg. 5%	Voltage Divider
R109	42KΩ	½	66-3428340	BTS-39K	Voltage Divider
R110	82KΩ	1	66-3828340	BTA-82K	Voltage Divider-See Note 13
R111	82KΩ 5%	1	66-3828340	BTA-82K-5%	Horiz. Osc. Grid
R112	10KΩ	½	66-3108340	BTS-10K	Horiz. Osc. Transformer Shunt
R113	56KΩ 5%	1	66-3568340	BTA-56K-5%	Horiz. Osc. Plate
R114	22KΩ	½	66-3228340		Parasitic Suppressor
R115	180KΩ	½	66-4188340	BTS-180K	Horiz. Output Grid-See Note 14
R116	4700Ω	2	66-2478340	BTB-4700	Horiz. Output Screen
R117	560KΩ 5%	½	66-4568340	BTS-560K-5%	Feedback
R118	4.7Ω	½	66-9478340		HV Rect. Filament-Wire Wound
R119	680KΩ 20%	1	66-4685340		HV Filter
R120	1000Ω	1	66-2104340	BTA-1000	Decoupling-See Note 3
R121	5600Ω	½	66-2568340	BTS-5600	Filter-See Note 10
R122	5100Ω	5	33-5546-28	1 3/4A-5000	Filter-Wire Wound-See Note 3
R123	100Ω	½	66-1108340	BTS-100	Focus Coil Shunt-See Note 15
R124	220KΩ	½	66-4228340	BTS-220K	Bleeder-See Note 10
R125	15Ω	2	66-0158340	BW-2-15	Bias Network- Wire Wound
R126	470Ω	½	66-1478340	BTS-470	Filter Choke Shunt-See Note 16
R127	2500Ω	½	66-2258340	BTS-2700	Horiz. Shaping-See Note 17
R128	680KΩ	½	66-4688340		HV Filter-See Note 10

Note 1. Model 50-T1104 previous to run 4 uses a 5100Ω resistor in this application.
Note 2. Some models use a 15KΩ resistor in this application.
Note 3. Some models use a 5600Ω resistor in this application.
Note 4. Models 50-T1400, 1401, 1402, 1430 previous to run 5 and model 50-T1104 uses a 3300Ω resistor in this application.
Note 5. Models 50-T1400, 1401, 1402, 1430 previous to run 5 and model 50-T1104 uses a 4700Ω resistor in this application.
Note 6. Models 50-T1400, 1401, 1402, 1430 previous to run 5 and model 50-T1104 uses a 100Ω resistor in this application.
Note 7. Models 50-T1400, 1401, 1402, 1430 previous to run 5 and model 50-T1104 uses a 5600Ω resistor in this application.
Note 8. Not used in models 50-T1400, 1401, 1402, 1430 previous to run 5 and model 50-T1104.
Note 9. Models 50-T1400, 1401, 1402, 1430 previous to run 5 and model 50-T1104 uses a 1500Ω resistor in this application.
Note 10. Not used in all models.
Note 11. Some models use a 820KΩ resistor in this application.
Note 12. Some models use a 5600Ω or 5100Ω resistor in this application.
Note 13. Some models use a 100KΩ resistor in this application.
Note 14. Models 50-T1400, 1401, 1402, 1430 previous to run 7 use a 270KΩ resistor and model 50-T1104 uses a 390KΩ resistor in this application.
Note 15. Models 50-T1400, 1401, 1402, 1430 previous to run 5 and model 50-T1104 use a 180Ω resistor in this application.
Note 16. Used only in model 50-T1104 after run 2.
Note 17. Used in model 50-T1104 only.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC	700VCT	5VAC	6.3VAC	32-8411-1			TP-355 ③
	② 2.1A	.250ADC	③ 3A	② 1.7A				
				SEC. 4				
				6.3VAC				
				② 7.1A				

③ Drill new mounting hole.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	160Ω	325Ω	32-8304			TBO-1	Vert. Block Osc. Trans
T3	510Ω	11.5Ω	32-8421 ①		HVO-6	TFB-3	Hor. Output Trans.
	Tap ②	Tap ②	32-8409 ②				
	100Ω	1.5Ω					
T4	760Ω	9Ω	32-8405			TSO-5	Vert. Output Trans.
T5A	13.5Ω		32-9622	DY-7	MD-3		Hor. Deflection Coil
B	66Ω						Vert. Deflection Coil
T6	170Ω		76-2622-5		MF-1		Focus Coil

① Used in models 50-T1400, 50-T1401, 50-T1402, 50-T1430.
② Used in model 50-T1104.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T7	3800Ω	3.5Ω	425Ω	.7Ω	32-8367-1	A-3823	A-3018	RO-6	

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA PHILCO PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1	PM	3.5Ω	36-1615-11	4676	46A15	
	CONE DIA.	V. C. DIA.				
SP2	4" x 6"	9/16"				

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 cy)	REPLACEMENT DATA PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.250ADC	80Ω	5.7 Henries	32-8367-1				

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA PHILCO PART No.	MEISSNER PART No.	NOTES
L2	Ant. Coil	.7Ω	.7Ω	•		• Part of tuner, #76-5433
L3	Ant. Coil	.7Ω	.7Ω	•		
L4	FM Trap	0Ω		•		
L5	Ant. Loading	0Ω		•		
L6	RF Grid Coils	0Ω		•		
L7	RF Plate Coils	0Ω		•		
L8	RF Coil	0Ω	0Ω	•		
L9	Mixer Grid Coils	0Ω		•		
L10	RF Choke	.2Ω		•		
L11	Osc. Coils	0Ω		•		
L12	Conv. Plate Coil	.1Ω		•		
L13A	Adj. Channel Video Trap	.1Ω		32-4234-8		
B	Adj. Channel Video Trap			32-4234-4		
L14	Grid Choke	.2Ω		32-4112-15		Model 50-T1104
L15	1st Video IF	.3Ω		32-4233-4		
L16	2nd Video IF	.3Ω		32-4359		
L17	RF Choke	.1Ω		32-4112-11		
L18	Fil. Choke	.1Ω		32-4112-11		
L19	Fil. Choke	.1Ω		32-4112-11		
L20	3rd Video IF	.3Ω		32-4359		
L21	RF Choke	.1Ω		32-4112-11		
L22	4th Video IF Plate Coil	.3Ω		32-4234-1		
L23	Sound Trap	.1Ω		32-4234-7		

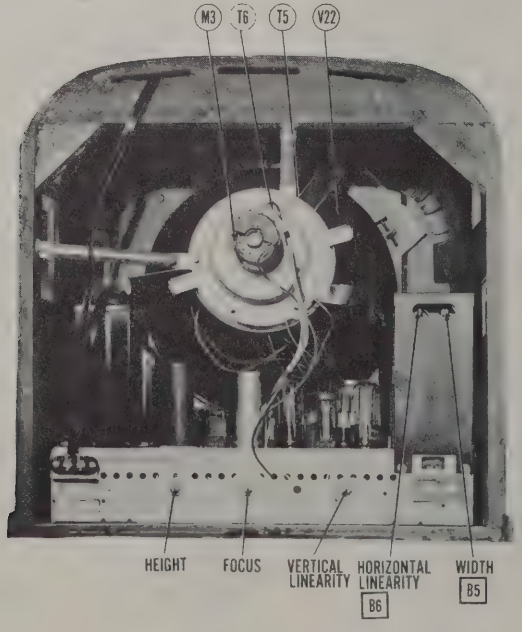
PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF) CONT.

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	PHILCO PART No.	MEISSNER PART No.	
L24	4th Video IF Grid Coil	.3Ω		32-4233-2		
L25	Fil. Choke	.1Ω		32-4112-11		
L26	5th Video IF	.3Ω		32-4234-1		
L27A	Peaking	2.5Ω		32-4143-1		40 microhenries
B	Peaking			32-4143	19-1921	150 microhenries
L28	Peaking	5.8Ω		32-4143-7	19-1922	250 microhenries
L29	Peaking	5.8Ω		32-4143-7	19-1922	250 microhenries
L30	Peaking	5.8Ω		32-4143-7	19-1922	250 microhenries
L31	Peaking	5.1Ω		32-4143-5	19-1921	180 microhenries
L32	Peaking	5.1Ω		32-4143-5	19-1921	180 microhenries
L33	1st Sound IF	.1Ω		32-4302-3		
L34	2nd Sound IF	.8Ω	.8Ω	32-4236		
L35	Ratio Det. Trans.	.1Ω	.1Ω	32-4317-2		
L36	Fil. Choke	.1Ω		32-4112-11		
L37	Horiz. Osc. Coil	125Ω		32-4367		Tap at 35Ω
L38	RF Choke			32-4143-7		Not used in all models.
L39	Horiz. Lin.	.3Ω		32-4211-1		
L40A	Width Coil	25Ω		32-4419-2		
B	Width Coil			32-4419		
L41	Fil. Choke					Not used in all models.
L42	RF Choke			32-4264-1		Used in model 50-T1104

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M1A	RF Tuner	76-5433	
B	RF Tuner	76-4402-6	
C	RF Tuner	76-4402-9	
M2A	Fuse	45-2656-8	.25A 250V Type AGX Models 50-T1400, 50-T1401, 50-T1402, 50-T1430
B	Fuse	45-2656-10	3/8A Model 50-T1104
M3	Ion Trap	76-3913-4	
	Switch	76-4402-6	Band, Model 50-T1104
	Safety Glass	54-4754	Model 50-T1400
	Safety Glass	54-7595-8	Model 50-T1401
	Safety Glass	54-7983-1	Models 50-T1402, 50-T1104
	Safety Glass	54-7943-5	Model 50-T1430
	Knob	56-6596-1	Channel selector, Models 50-T1400, 50-T1401, 50-T1104
	Knob	56-6596-3	Channel selector, Models 50-T1402, 50-T1430
	Knob	54-4662-1	Fine tuning, Models 50-T1400, 50-T1401, 50-T1402, 50-T1104
	Knob	54-4662-2	Fine tuning, Model 50-T1430
	Knob	54-4707-2	Contrast, Models 50-T1400, 50-T1401
	Knob	54-4664-1	Contrast, Models 50-T1402, 50-T1104
	Knob	54-4707	Contrast, Model 50-T1430
	Knob	54-4703-2	Volume, Models 50-T1400, 50-T1401
	Knob	54-4661-1	Volume, Models 50-T1402, 50-T1104
	Knob	54-4703	Volume, Model 50-T1430
	Knob	54-4707-2	Horiz. hold, Models 50-T1400, 50-T1401
	Knob	54-4664-3	Horiz. hold, Models 50-T1402, 50-T1104
	Knob	54-4707	Horiz. hold, Model 50-T1430
	Knob	54-4699-3	Vert. hold, Models 50-T1400, 50-T1401
	Knob	54-4659-3	Vert. hold, Models 50-T1402, 50-T1104
	Knob	54-4699	Vert. hold, Model 50-T1430
	Knob	54-4659-1	Brightness, Models 50-T1104, 50-T1402
	Knob	54-4699-3	Brightness, Models 50-T1400, 50-T1401
	Knob	54-4699	Brightness, Model 50-T1430
	Knob	54-4750	Antenna tuning



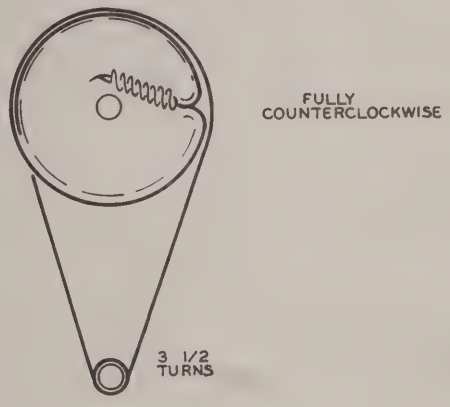
CABINET-REAR VIEW

DISASSEMBLY INSTRUCTIONS

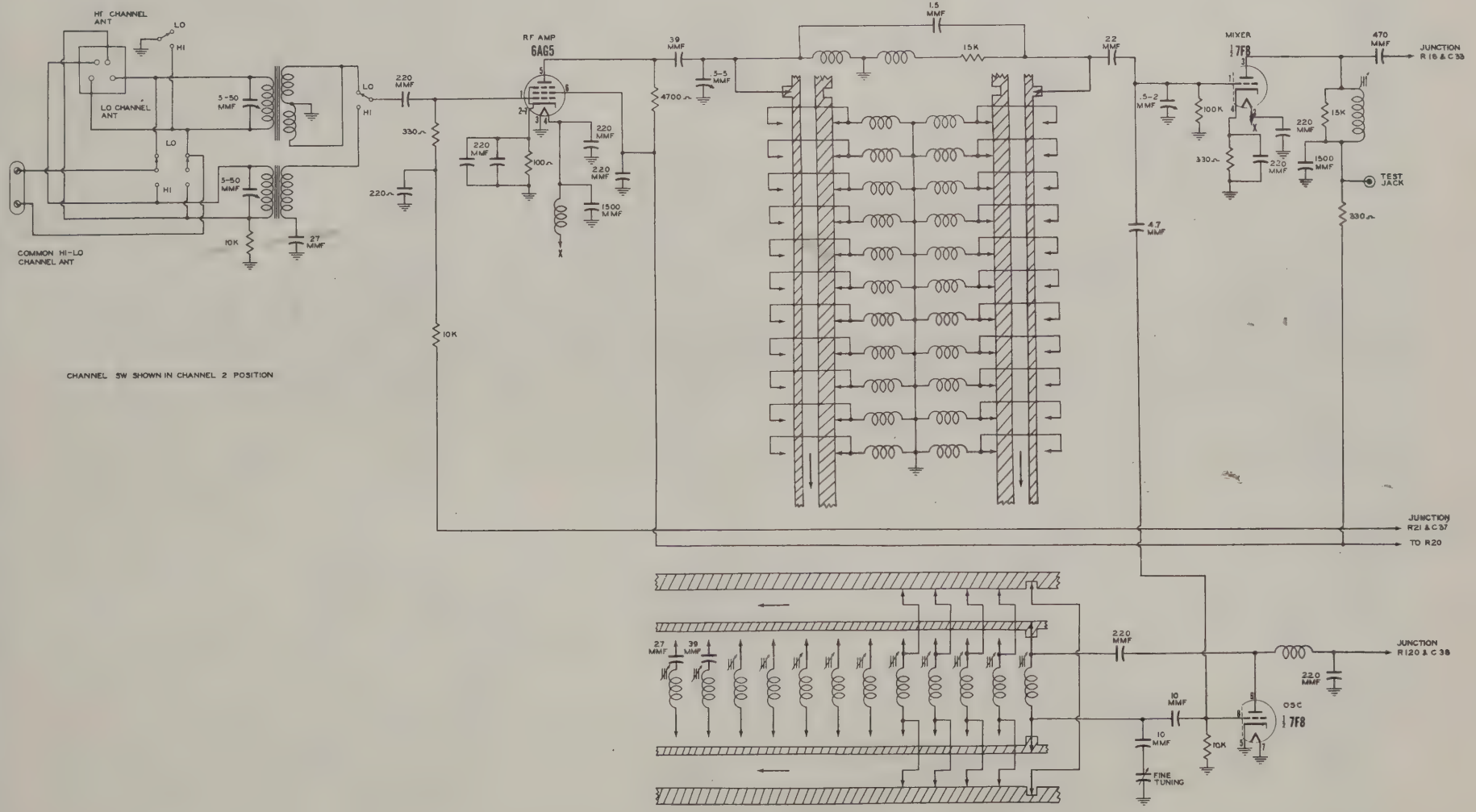
1. Remove seven push-on type control knobs.
2. Remove six wood screws holding rear cover in place.
3. Disconnect built-in antenna.
4. Disconnect yoke leads.
5. Release ground clamp.
6. Remove power cable from base of picture tube.
7. Remove high voltage lead from picture tube.
8. Remove four 1/4" hex head bolts from chassis.
9. Remove chassis.

NOTE: PICTURE TUBE REMOVAL.

1. Follow instructions as given above.
2. Remove two 7/16" hex nuts securing deflection yoke to cabinet at rear of set.
3. Remove three 7/16" nuts from braces securing picture tube to front of cabinet.
4. Remove picture tube.



FINE TUNING DIAL CORD STRINGING



ALTERNATE TUNER

SILVERTONE MODELS
101.774-2, 101.774-4

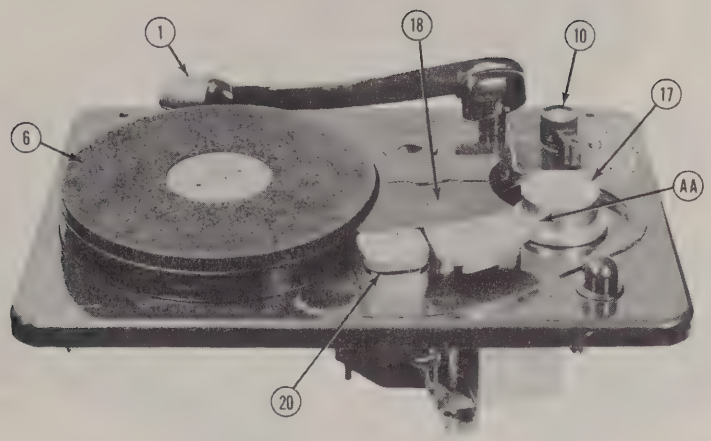


Figure 1

GENERAL INFORMATION

The Silvertone Models 101.774-2 and 101.774-4 are combination record players and magnetic recorder-reproducers. They will record up to an hour program. The recordings may be played back immediately after the wire has been rewound. A recording will last indefinitely, since the playback process has no effect on the wire; or new recordings may be made on an old spool, since, in the recording process, any previous recording is erased.

The turntable serves as a turntable for records as well as the takeup spool for the recording mechanism. One motor is used, which, through the action of the control mechanism, serves as a drive to the turntable and also the rewind pulley. The rewind speed is approximately five times as fast as the forward speed, so it takes only about 12 minutes to rewind a complete one-hour spool. At the end of the rewind, the leader will automatically trip the "Reset" button, turning the mechanism off.

The recorder is designed for operation from 105-125 volts, 60-cycle, alternating current (AC) only.

Chassis Differences -

101.774-2 uses a pickup arm with a Syntronic Cartridge and a pilot lamp.
101.774-4 uses a pickup arm with a Syntronic Cartridge and no pilot lamp.

Manufactured by:

Sears, Roebuck & Co.
926 S. Homan Street
Chicago, Illinois

Note: Parts should be ordered from the nearest Sears, Roebuck & Co. retail store or mail order branch.

This material compiled and published by

HOWARD W. SAMS & CO., INC., INDIANAPOLIS, INDIANA

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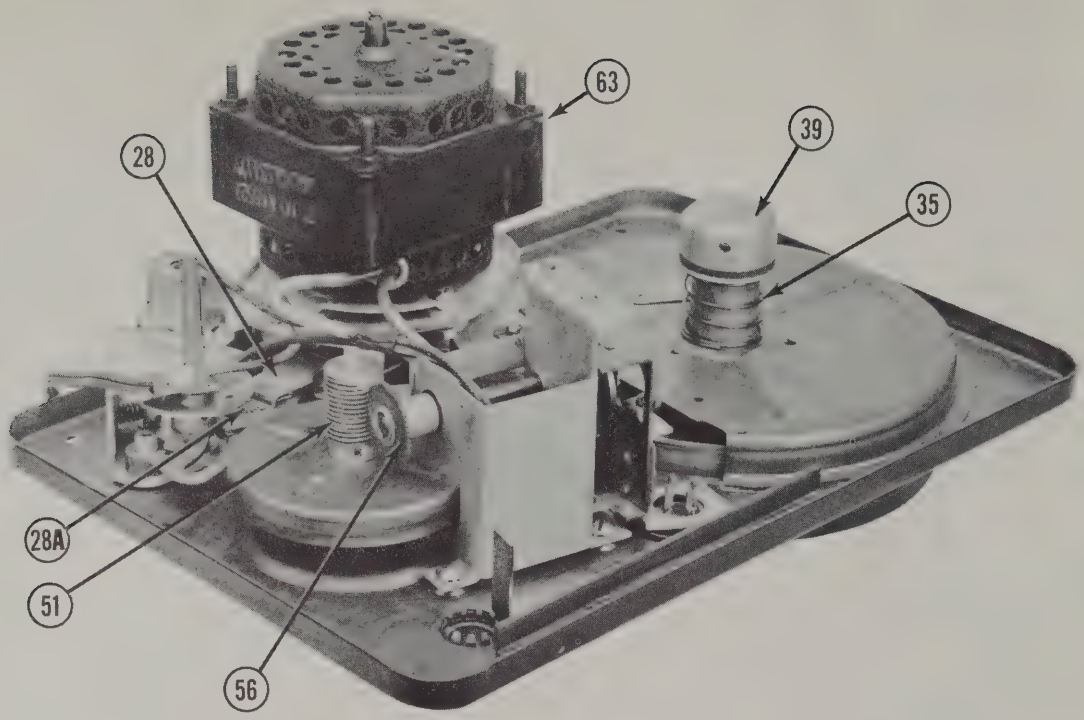

Figure 2

OPERATION

Proper placement of the wire on the machine is probably the most important initial operation. If not done properly, "Wows" may result due to variations in speed:

1. Depress the "Reset" button (18).

2. Before placing the wire on the mechanism, the recording head (20) should be brought to its top position. This may be done by turning the selector switch knob (10) to "Rewind" and stopping the head at the top of its travel.

3. Place the spool - label side up - over the hub (17), and press on the storage spool until it is firmly seated.

4. Loosen the end of the tape leader from the spool and carefully pull it past the recorder head (20). Place the tape leader in the channel in the rim of the turntable. While holding the leader against the inner edge of the channel, rotate the turntable, by hand, until two complete turns of wire are in the channel. The full length of the leader must be pressed against the inner surface of the channel or speed variations will result.

5. Press the "Reset" button (18) and turn the control knob (10) to "Play" or "Record" position, depending on which is desired. The mechanism will now play or record continuously for a period of time equivalent to the size spool of wire in use. If the recorder is not turned off manually, the tape leader, which is fastened to the end of the wire, passes under the switch housing (19) contacting the switch arm, thereby tripping the switch and shutting off the recorder automatically.

NOTE: When changing the position of the record control lever, snap the lever quickly from one position to the other. Do not handle the wire. It is not necessary, nor is to advisable, to touch the wire at any time. When handling a spool or wire, always hold it by the edges of the spool.

CAUTION: Do not pull the power plug from the outlet while the wire is being rewound. This will cause the wire to fly off the spool due to the inertia of the turntable which will revolve for a few seconds after the motor stops.

To rewind, place the tape leader in the channel of the storage spool and rotate the spool, by hand, until several turns of wire are in the channel. Turn the control knob to "Rewind" and press the "Reset" button (18). The recorder will be shut off when the tape leader on the end of the wire contacts the switch arm of the automatic switch assembly.

To play records on the recorder, rewind the wire on the spool; turn the control knob to the "Off" position and press down on the "Reset" button (18). Place a record on the turntable; turn the control knob to the "Play" position; raise the pickup arm (1) from its rest, swing arm over and set needle down in the starting groove on the right-hand side of the record. A boss (AA), Figure 1, on switch cover has been provided for resting the pickup arm in an "out-of-the-way" position while changing records. Allow the inside face of the pickup arm to engage the boss (AA), then turn the control knob (10) to the "Off" position. However, when the user is finished with the unit as a record player or record recorder, the arm should be returned to a locked position on the rest spring. Turn the control knob (10) to the "Off" position and remove the record.

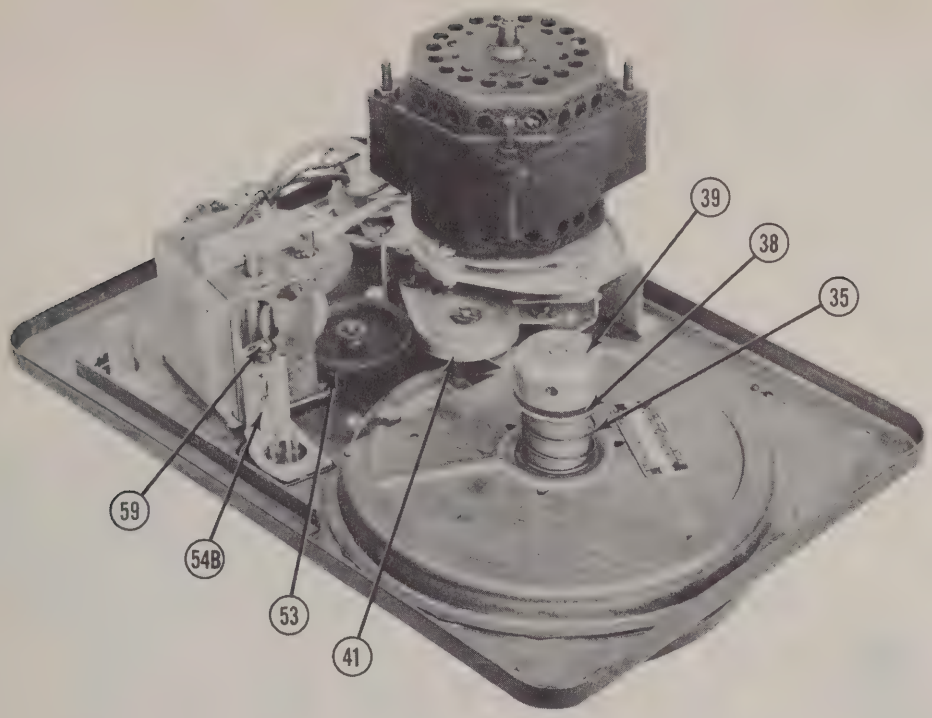

Figure 3

MECHANICAL ALIGNMENT

Cam and Gear Adjustment -

1. Loosen the set screws holding cam (55) to shaft (56). (See exploded view.)

2. Insert a .006" feeler gauge between the gear shoulder (56A) and the shaft housing.

3. Push the cam (55) and the shaft and gear assembly (56) toward each other until all play is taken up.

4. Tighten the cam set screw and remove the feeler gauge.

Worm and Gear Adjustment -

Hold the fiber gear (56) with one hand and rotate the rewind pulley (51) with the other. Check the clearance between the fiber gear (56) and worm of the rewind pulley (51) at least every 90° rotation of the fiber gear. The clearance should be as little as possible without causing drag or binding.

Make Adjustment as Follows:

1. Remove idler wheel (53).

2. Loosen the three mounting screws, holding level wind assembly (54) to base plate, about 1/4 to 1/2 turn.

3. Move the entire assembly until the proper adjustment is made.

4. Tighten the mounting screws.

5. Rotate the rewind pulley (51) so that the slide assembly will go through its entire stroke to be sure the recording head (20) does not bind on the edge of the hole in the mounting board.

6. After the adjustment has been checked, replace the idler wheel (53).

Turntable Torque Adjustment -

Proper adjustment of the turntable torque is very important. Insufficient torque will result in inconsistent turntable speed, causing "Wow." Too much torque will result in wire breakage when switching from "Rewind" to "Play."

1. With the power connected, turn the control knob (10) to the "Play" position.

2. Loosen the locknut on the adjustment screw (64) in the motor mounting bracket. (See Figure 4.)

3. If the turntable does not rotate, turn the adjustment screw counterclockwise until the idler drive pulley (30) barely makes contact with the turntable, but enough to allow the turntable to rotate.

4. If the turntable is rotating, turn the screw clockwise until the turntable stops rotating; then back the screw out until the idler drive pulley barely makes contact with the turntable, but enough to allow the turntable to rotate.

5. After this adjustment is made, turn the adjustment screw counterclockwise 3/4 turn.

6. Tighten the locknut, being careful not to turn the adjustment screw.

A PHOTOFACT "EXPLODED" VIEW

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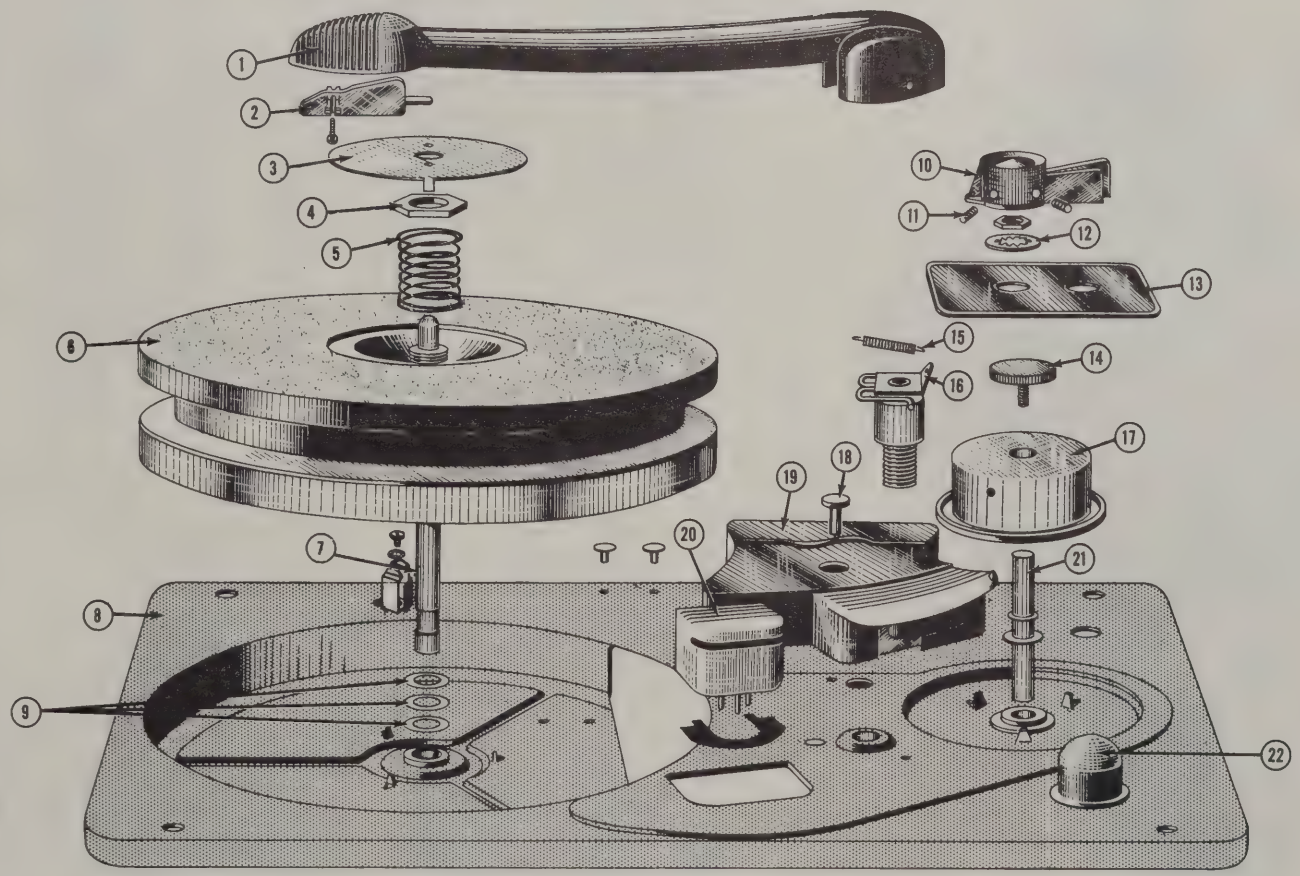

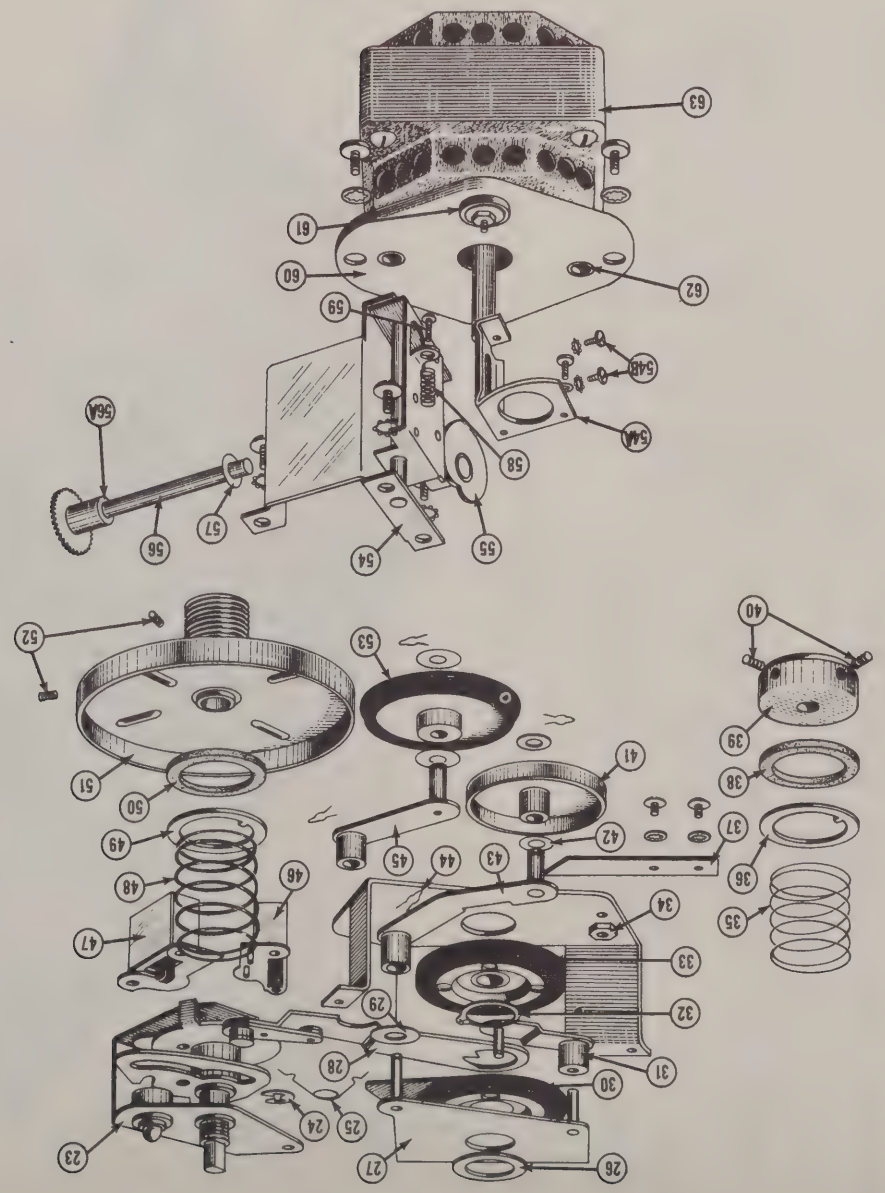
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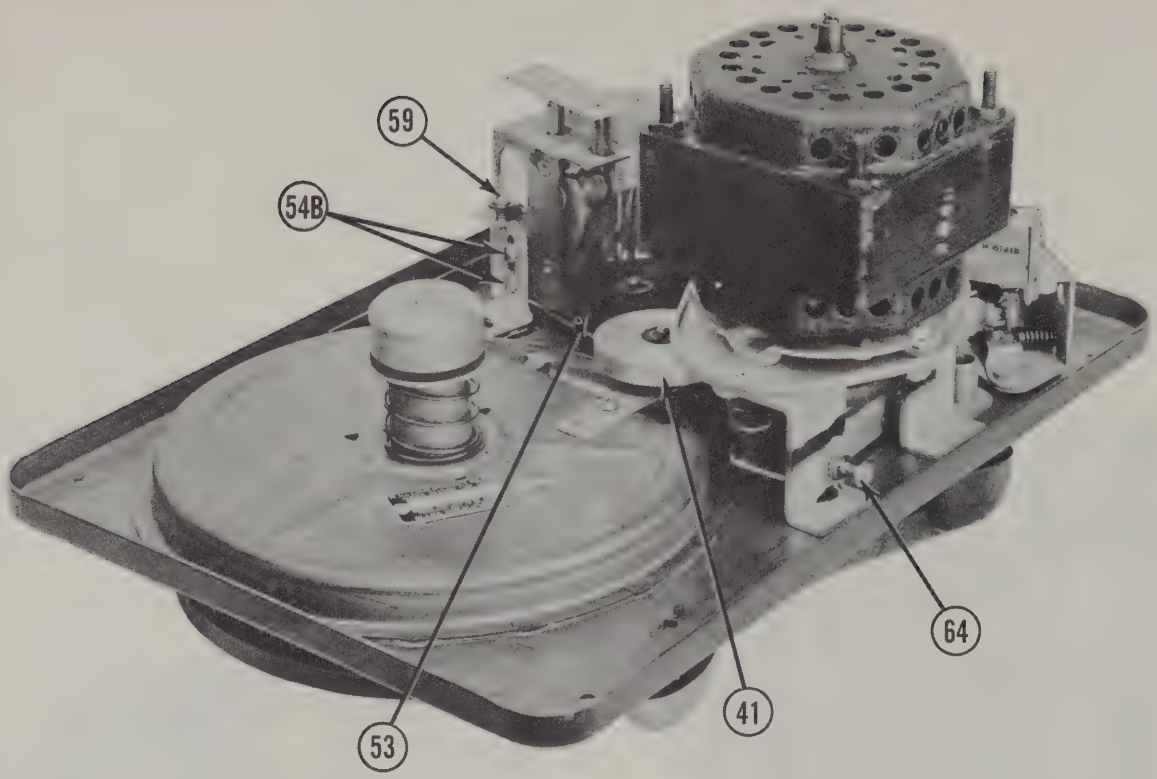

Figure 4

Level Wind Adjustment. (See Figure 4) -

1. Rotate the rewind hub (17) until the recording head (20) is in its extreme downward position. In this position, the wire slot in the recording head should be approximately .020" above the motor board. If the wire is too high or too low, with respect to the motor board, it may be adjusted as follows:

(a) Loosen the two set screws (54B) slightly.

(b) Make adjustment by turning the adjusting screw (59).

(c) After adjustment, tighten the two screws (54B).

2. The reset switch arm, which is fastened to the top of the switch housing (19), should be 15/32" from the baseplate. This may be adjusted by bending the arm.

Rewind Spindle Assembly End Play -

1. Remove the hub lock screw (14) and lift off the rewind hub.

2. Loosen the set screws (52) in the pulley assembly (51).

3. Place a .006" feeler gauge between the thrust washer on the shaft (21) and the end of the bearing on the motor board.

4. Hold the top of the rewind shaft against the feeler gauge and press up on the rewind pulley until all end play is removed.

5. Tighten the set screws.

Turntable Assembly End Play. (See Exploded View) -

1. Loosen the set screws (40) in the turntable shaft support (39).

2. Push the felt washer (38) and keyed washer (36) up out of the way.

3. Place a .006" feeler gauge between the support (39) and the end of the bearing.

4. Push down on the turntable assembly (6) and up on the support (39) until all end play is removed.

5. Tighten the set screws (40) and remove the gauge.

Selector Switch Toggle Action -

Check the toggle action by moving the control knob (10) slowly from "Play" to "Rewind" position, and back, and observing the action of the selector switch (23). The toggle action should snap the bracket and post assembly (27) with a positive and even action to each position.

To Adjust the Toggle Action -

1. Turn the control knob to the "Rewind" position.

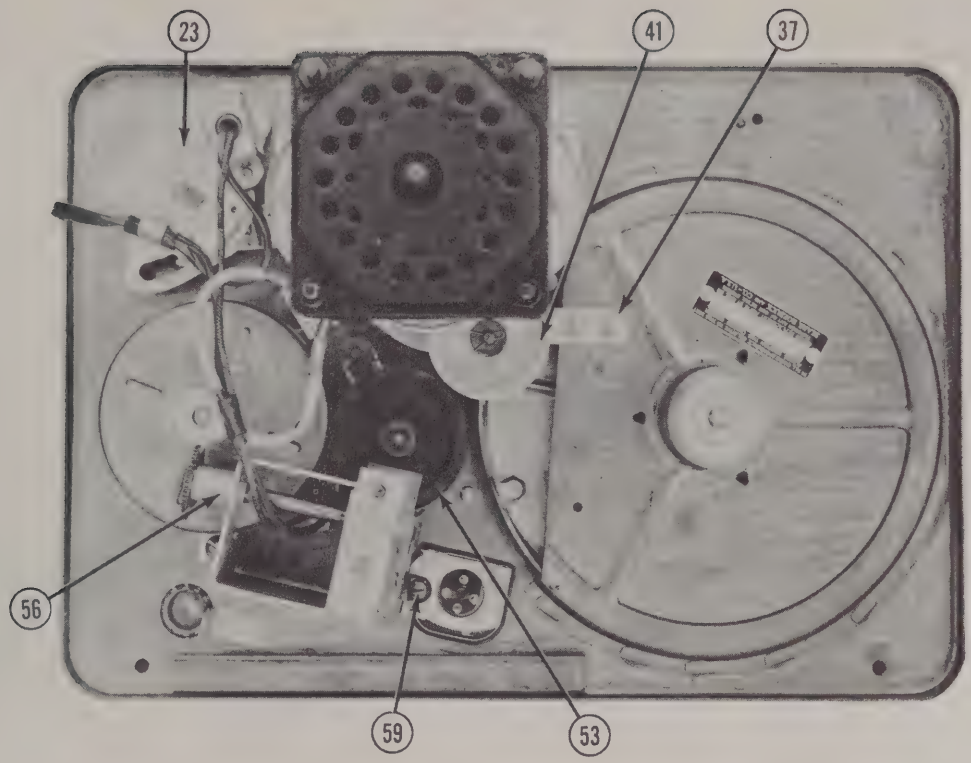

Figure 5

2. Hold the drive-control spring (25) with pliers, and loosen the set screw (28A) in the arm and link assembly (28). (See Figure 2.)

3. Moving the adjustment toward the rewind pulley (51) gives more positive action when switching to the "Rewind" position.

4. Moving the adjustment toward the switch assembly (23) gives more positive action when switching to "Play" position.

5. Normally, the position should be midway in the adjustment range.

6. Tighten the set screw and check the adjustment.

LUBRICATION

Factory lubrication should be sufficient for a long period of service; however, should it become necessary to lubricate the recorder, do so as follows:

Use Sta-Put No. 512 grease on the following:

1. Pins of the bracket and post assembly (27).

2. Washers (26), one of which is located just below the bracket and post assembly (27).

3. Bearing surfaces of the drive control (25).

4. All moving parts of the switch assembly (23).

5. The worm gear of the rewind pulley assembly (51).

6. The shaft of the level wind shaft and gear assembly (56); also bearing faces.

7. Level wind guide shaft of the frame and housing assembly (54).

8. Cam (55).

Use Sta-Put No. 320 Oil on the following:

1. Turntable shaft (7).

2. Shaft (21).

CAUTION: All Pressed Oilite Bearings do not require oil. Do not, under any circumstances, permit oil or grease to come in contact with the rubber tires of the idler pulleys or drive pulley; turntable rim; turntable pulley (41), or the rewind pulley (51). If grease and oil are on the rubber tires, replace them with new ones, and clean the other surfaces with carbon tetrachloride. Avoid overlubrication.

Cleaning of the Recording Head -

Weak reproduction, when not accompanied by high distortion, is probably due to dirt or foreign matter in the recording gap. Clean the gap with a stiff-bristle brush.

CAUTION: Do not use any metallic object for this purpose.

PARTS LIST

Ref. No.	Part No.	Description
1	R65013	Pickup Arm
2	R65101	Cartridge - Syntronic Pickup
3	R63193	Disc-Decorative
4	R63191	Nut - 1/2-28 Hex
5	R63192	Spring - Compression
6	R63392	Top - Turntable
	R63196	Clutch Disc - Turntable
	R63394	Turntable - Flocked (Complete)
7	R66471	Bottom Plate and Shaft Assembly
8		Base Plate
9	R63350	Washer-Spacing
10	R62967	Knob-Master Control
11	R49545	Allen Set Screw #8-32 Headless
12		Internal Tooth Lockwasher
13	R62968	Nameplate-Drive Control
14	R63195	Screw - Rewind Hub
15	R56699	Counterbalance Spring
16		Pickup Arm Pivot Bracket
17	R63358	Hub and Pin Assembly
18		Reset Button (Part of Item 19)
19	R63364	Automatic Switch Housing Assembly
20	R65675	Recorder Head
21	R63198	Shaft Assembly
22	R64519	Pilot Shield Assembly (101.774-2)
23	R64880	Switch Bracket Assembly (with On-Off Switch)
24	R61968	"C" Washer
25	R61927	Drive Control Spring
26	R61929	Flat Washer
27	R61998	Bracket and Posts Assembly
28	R62002	Arm and Link Assembly
29	R44641	Friction Washer
30	R63733	Idler Drive Wheel
31	R63175	Drive Link Assembly
32	R61949	Retaining Ring
33	R64543	Motor Drive Wheel
34		Hex Nut
35	R63361	Turntable Spring
36	R63353	Keyed Washer
37	R63391	Pulley Stop
38	R63355	Felt Washer
39	R63354	Turntable Shaft Support
40	R49533	Allen Set Screw #6-32 Headless
41	R63395	Pulley and Bushing Assembly
42	R61981	Paper Washer
43	R63398	Movable Link Assembly
44	R61972	Spring Clip
45	R63399	Rewind Link Assembly
46	R61994	On-Off Switch Assembly
47	R61995	Transfer Switch Assembly (101.774-4)
48	R63360	Rewind Pulley Spring
49	R63353	Keyed Washer
50	R63355	Felt Washer
51	R63362	Rewind Pulley Assembly
52	R49533	Allen Set Screw #6-32 Headless
53	R65698	Rewind Idler Wheel Assembly
54	R65391	Level Wind Assembly (Including Items 55, 56, 57, 58 and 59)
55	R63374	Cam Assembly
56	R63343	Level Wind Cam Shaft Assembly
57	R63179	Paper Washer
58	R63382	Level Wind Spring
59		Adjusting Screw
60	R61913	Motor Mounting Plate
61	R61990	Rubber Grommet
62	R63383	Rubber Grommet
63	R65534	Motor Assembly
	R65527	Motor - 60-Cycle, 117-Volt (Alliance)
	R66427	Motor - 50-Cycle, 117-Volt (Alliance)
64	R203-10	Screw - Bracket and Pulley Assembly Adjusting

PHOTOFACT* Folder

WESTINGHOUSE MODEL
H-625T12 (CH. V-2150-197)

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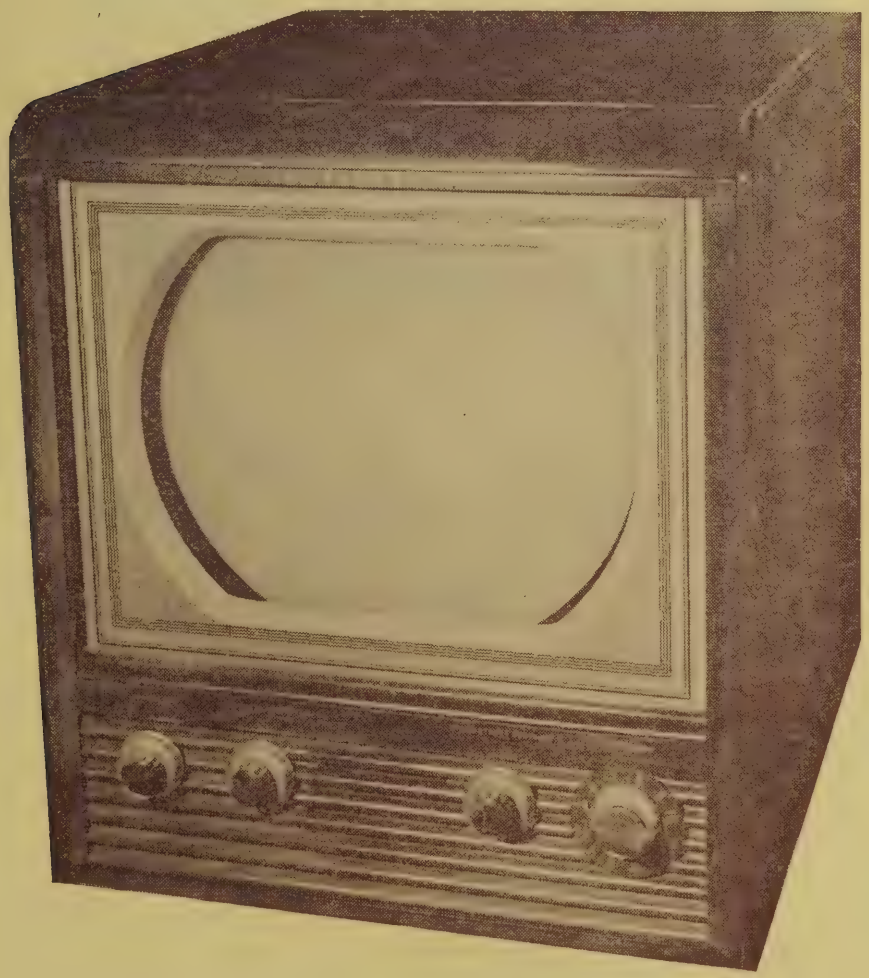

WESTINGHOUSE MODEL
H-625T12 (CH. V-2150-197)

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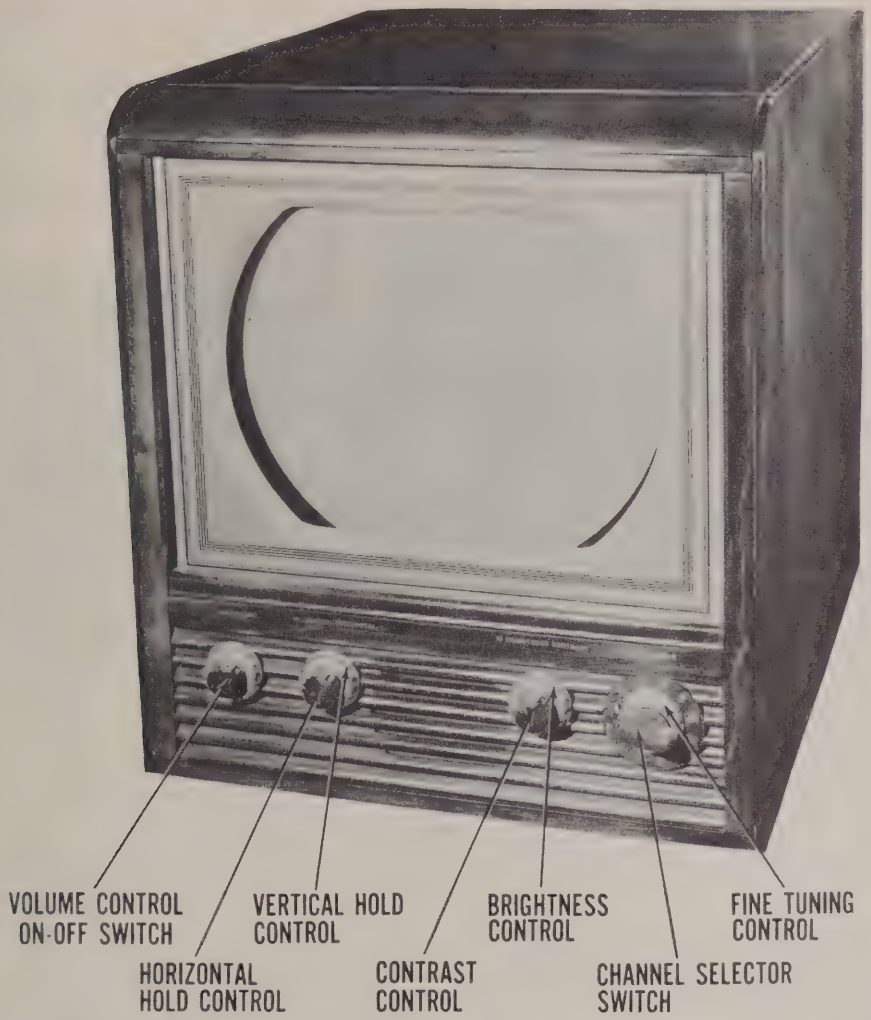

WESTINGHOUSE
MODEL H-625T12 (Ch. V-2150-197)

TRADE NAME	Westinghouse, Model H-625T12 (Ch. V-2150-197)
MANUFACTURER	Westinghouse Electric Corp., Home Radio Div., Sunbury, Pa.
TYPE SET	Television Receiver
TUBES	Twenty Three
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATING	1.8 Amp. at 117 Volts AC
TUNING RANGE—	Channels 2 thru 13

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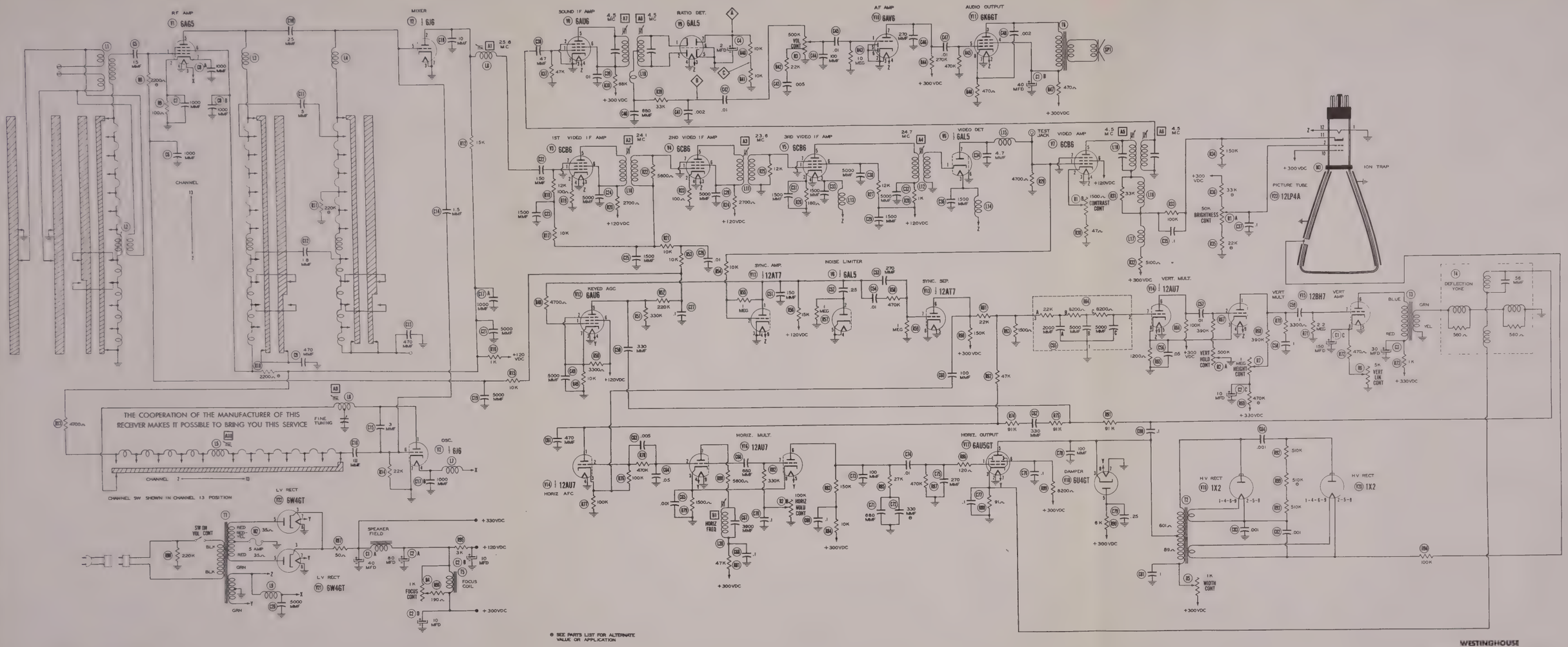

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● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

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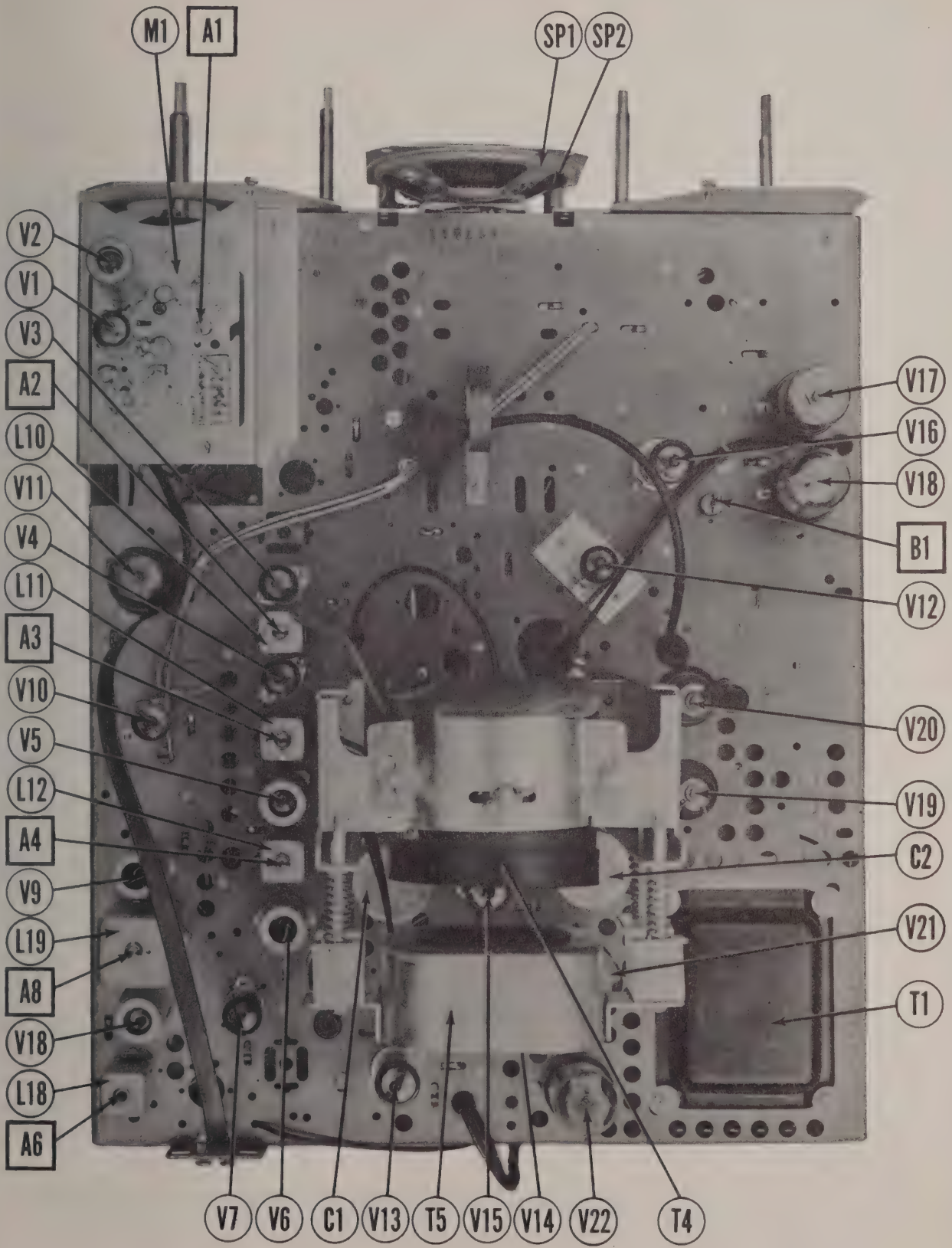
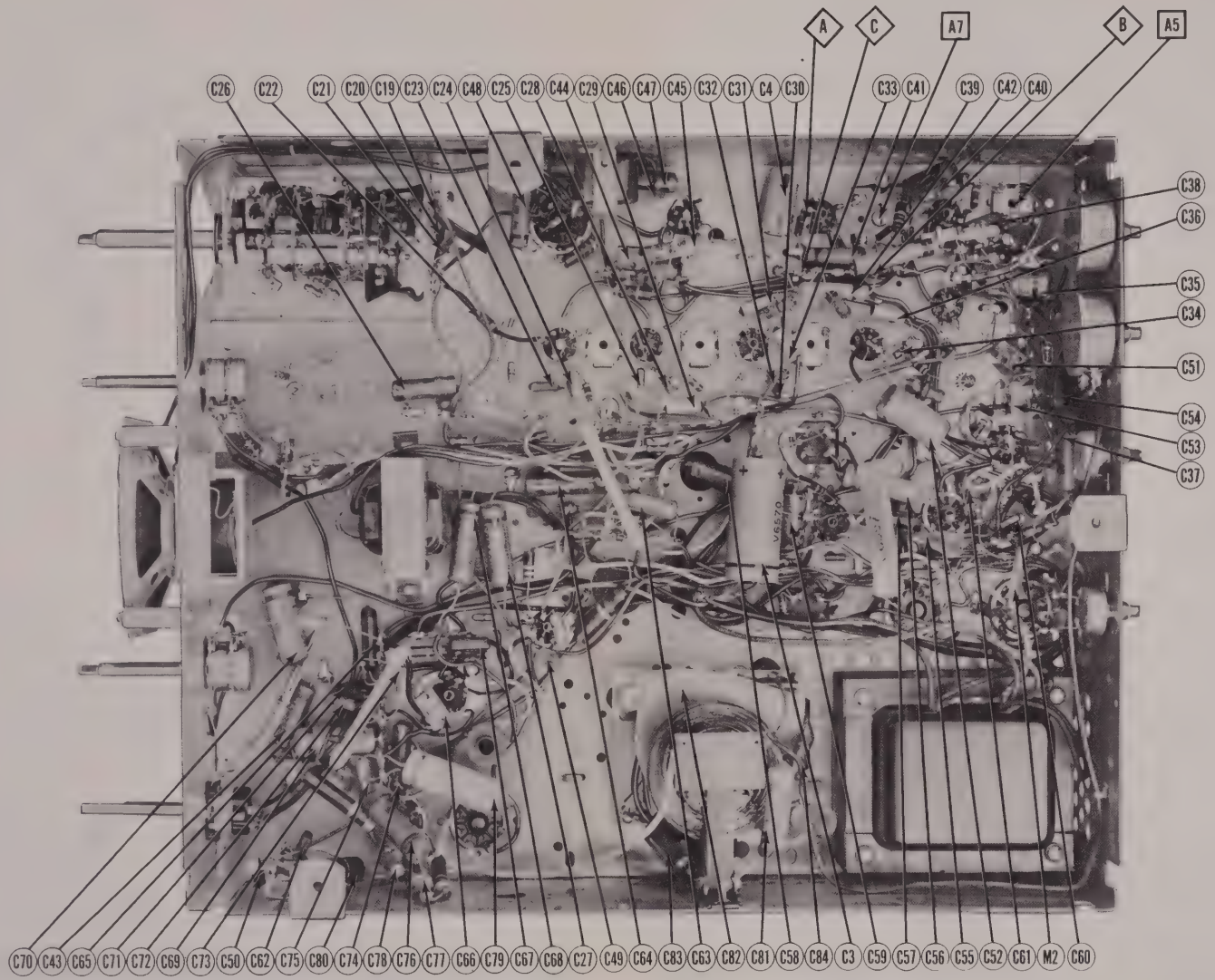
MODEL H-625T12 (Ch. V-2150-197)

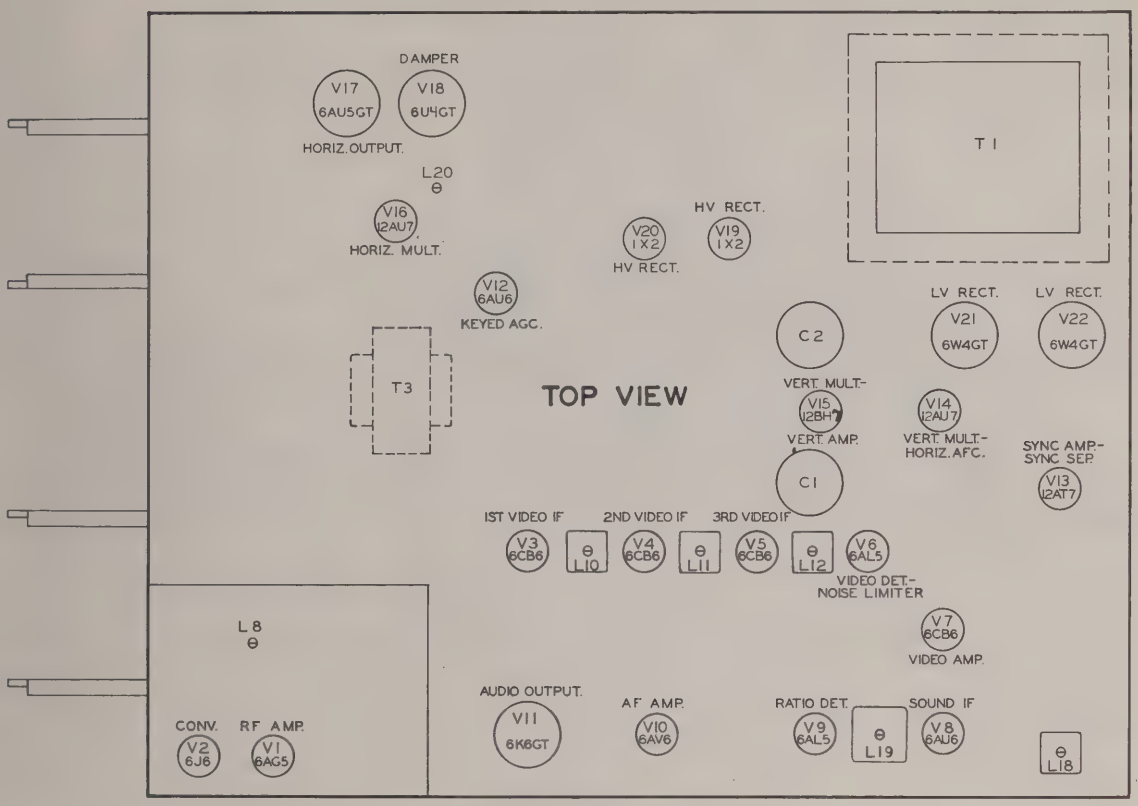
WESTINGHOUSE
MODEL H-625T12 (Ch. V-2150-197)

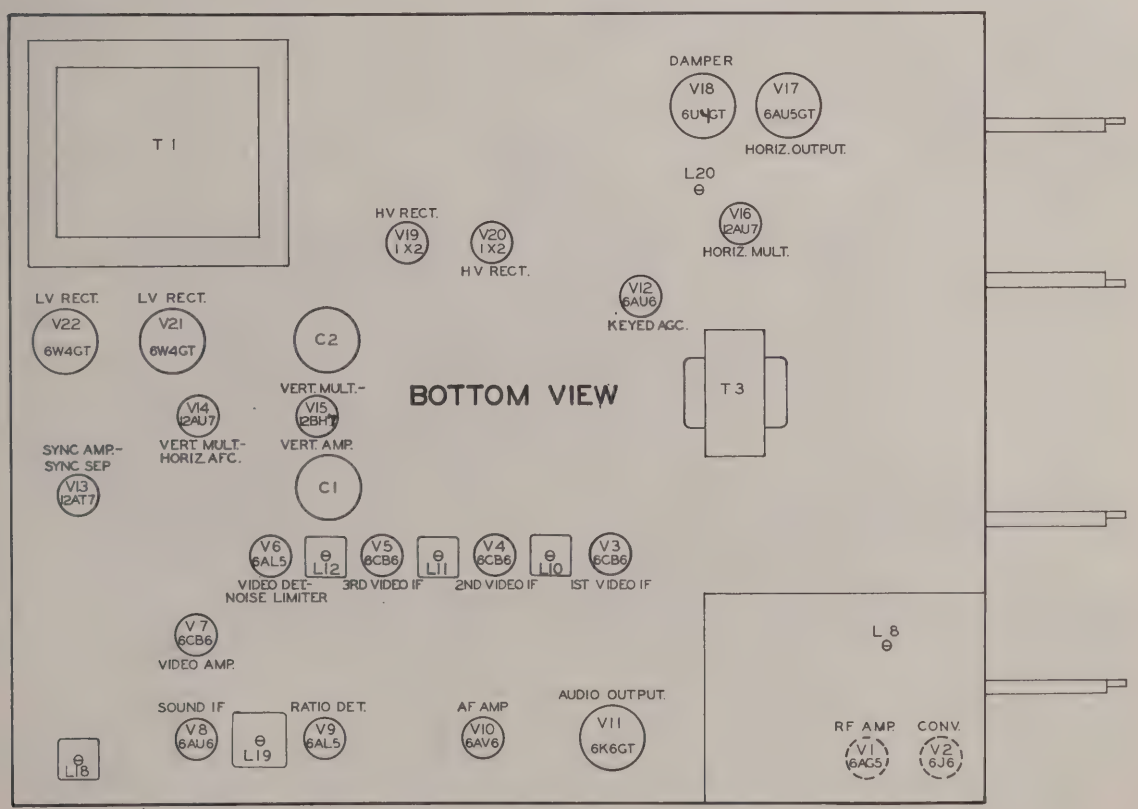


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To eliminate the high voltage shock hazard remove the horizontal output tube (V17) from its socket.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 with pin 1 removed to prevent erroneous indications.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	25.6MC (Unmod.)	Any	DC Probe to video test jack. Common to chassis.	A1	Adjust for maximum deflection. Attenuate signal generator to maintain a maximum -2 volts reading.
2.	Direct	"	24.1MC	"	"	A2	"
3.	Direct	"	23.6MC	"	"	A3	"
4.	Direct	"	24.7MC	"	"	A4	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Direct	High side to ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	25.3MC (10MC SWP)	23MC 23.4MC 24MC 25.3MC 26.1MC	Any	Vert. Amp. to Video test jack. Low side to chassis.		Check for response curve similar to figure 1. The 26.1MC marker should be at 50% response. If necessary, SLIGHTLY retouch A1 thru A4 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6.	.001MFD	High side to video test jack. Low side to chassis.	4.5MC (Unmod.)	Any	DC Probe to Point (A). Common to chassis.	A5, A6, A7	Adjust for maximum deflection. Attenuate signal generator to maintain a maximum -2 volts reading.
7.	.001MFD	"	"	"	DC Probe to Point (B). Common to Point (C).	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	.001MFD	High side to video test jack. Low side to chassis.	4.5MC (450KC SWP)	4.5MC	Any	Vert. Amp. to Point (A). Low side to chassis.	A5, A6, A7	Disconnect stabilizer capacitor C4. Adjust for maximum amplitude and symmetry as per figure 2.
7.	.001MFD	"	"	"	"	Vert. Amp. to Point (B). Low side to chassis.	A8	Reconnect capacitor C4. Adjust A8 to place 4.5MC at center of crossover lines. as per figure 3. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube (V2) and replace original 6J6 in its socket.
Set the fine tuning control to the mid-position of its range.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	211.25MC 215.75MC	13	Vert. Amp. thru 10KΩ to video test jack. Low side to chassis.	A9	Adjust to place sound marker as shown in figure 4. The video marker should be at 50% response.
9.	"	"	207MC (10MC SWP)	205.25MC 209.75MC	12	"		Check all high band channels to see if the sound marker can be placed well within the range of the fine tuning control. If not, a compromise adjustment of A9 will be required.
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
10.	"	"	85MC (10MC SWP)	83.25MC 87.75MC	6	"	A10	Adjust to place sound marker as shown in figure 4. The video marker should be at 50% response.
11.	"	"	79MC (10MC SWP)	77.25MC 81.75MC	5	"		Check all low band channels to see if the sound marker can be placed well within the range of the fine tuning control. If not, a compromise adjustment of A10 will be required.
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			

THE RF PORTION OF THIS RECEIVER IS PRE-SET AT THE FACTORY AND IS VERY STABLE AND SHOULD NOT REQUIRE ADJUSTMENT IN THE FIELD.

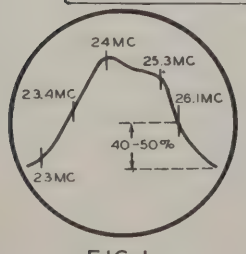


FIG. 1

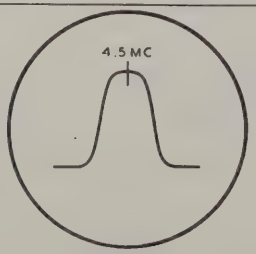


FIG. 2

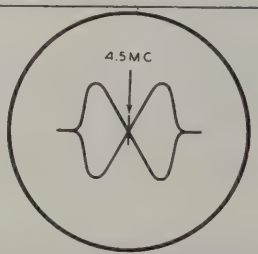


FIG. 3

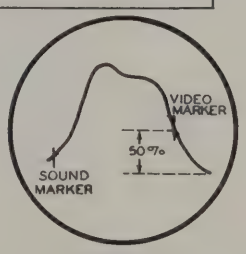
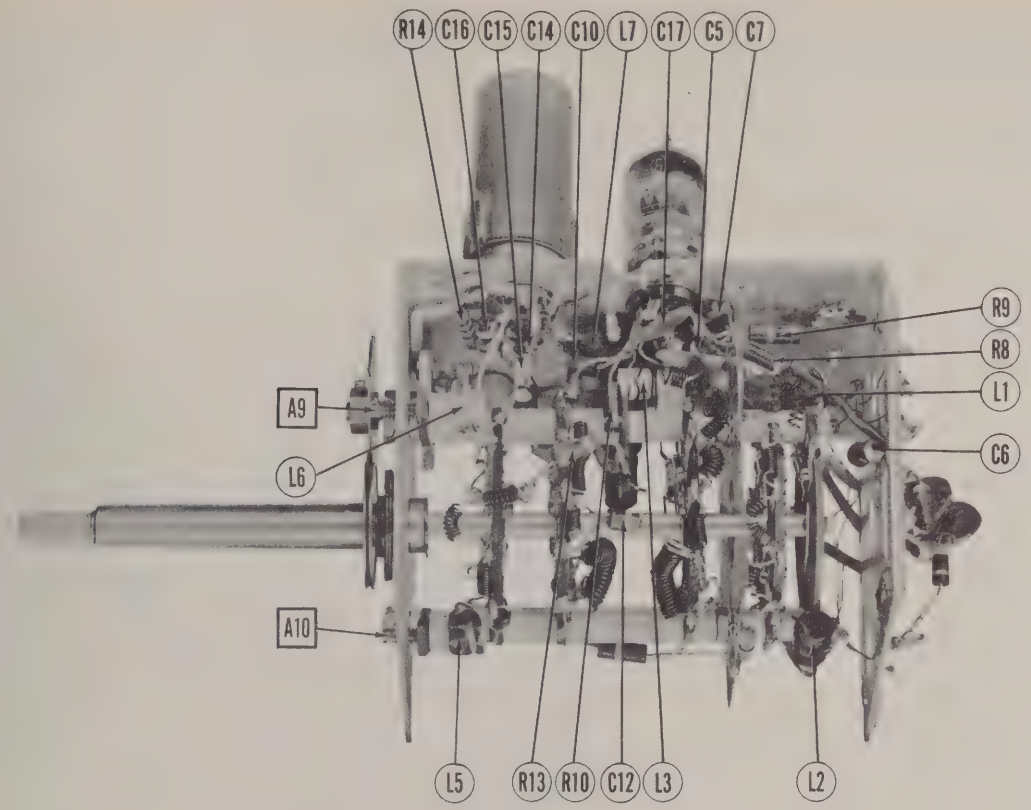
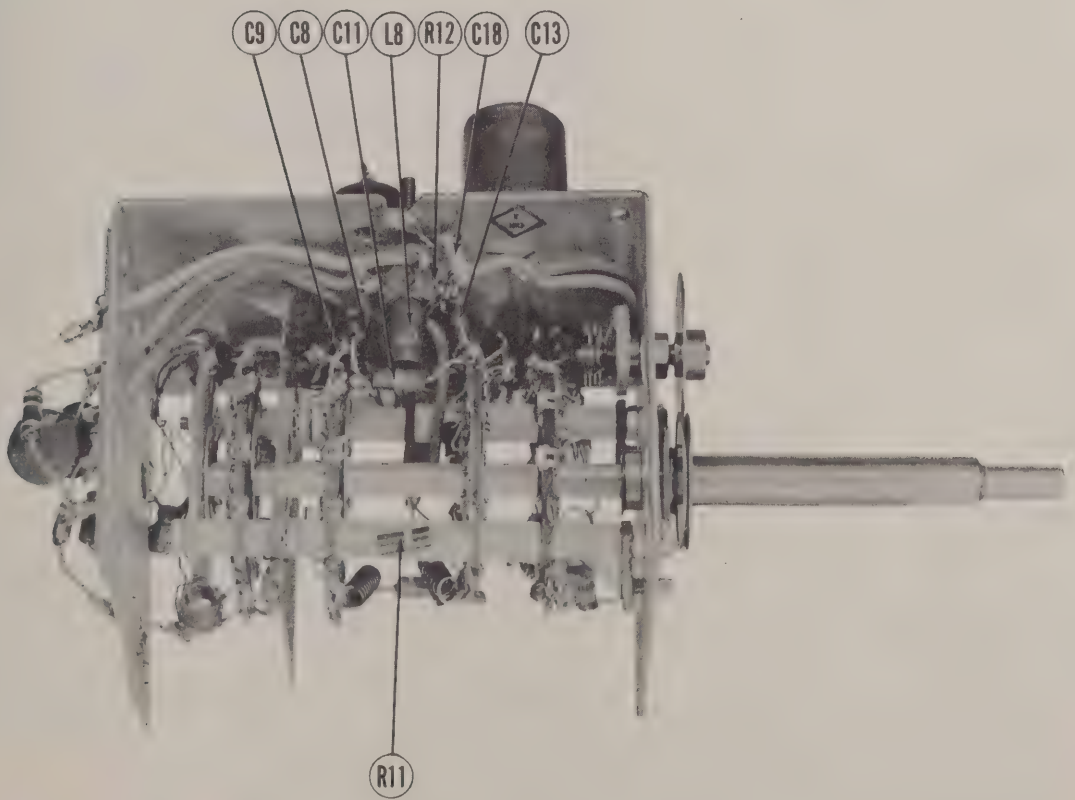


FIG. 4



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	.6VDC	.9VDC	6.3VAC	0V	85VDC	85VDC	.9VDC		
V 2	6J6	75VDC	60VDC	0V	6.3VAC	-1.4VDC	§-5.7VDC	0V		
V 3	6CB6	.6VDC	1.2VDC	6.3VAC	0V	90VDC	90VDC	0V		
V 4	6CB6	.6VDC	-1.2VDC	6.3VAC	0V	85VDC	85VDC	0V		
V 5	6CB6	0V	1.3VDC	6VAC	0V	115VDC	100VDC	0V		
V 6	6AL5	0V	-1.4VDC	5.2VAC	0V	0V	0V	-1VDC		
V 7	6CB6	-.5VDC	3.3VDC	0V	6.3VAC	275VDC	120VDC	0V		
V 8	6AU6	-.8VDC	0V	0V	6.3VAC	50VDC	50VDC	0V		
V 9	6AL5	-.2VDC	-.2VDC	6.3VAC	0V	0V	0V	-.4VDC		
V 10	6AV6	-1VDC	0V	0V	6.3VAC	0V	0V	90VDC		
V 11	6K6GT	0V	6.3VAC	250VDC	265VDC	0V	0V	0V	18VDC	
V 12	6AU6	65VDC	90VDC	0V	6.3VAC	0V	120VDC	90VDC		
V 13	12AT7	65VDC	-.2VDC	0V	0V	0V	36VDC	0V	0V	6.3VAC
V 14	12AU7	1.2VDC	-.1VDC	1.8VDC	0V	0V	50VDC	-2VDC	3.4VDC	6.3VAC
V 15	12BH6	60VDC 35VDC	-11VDC	3.4VDC	0V	0V	320VDC	0V	10VDC 22VDC	6.3VAC
V 16	12AU7	125VDC	0V	6VDC	6.3VAC	6.3VAC	120VDC	-9VDC	6VDC	0V
V 17	6AU5GT	-9.4VDC	0V	12VDC	0V	*	0V	6.3VAC	190VDC	
V 18	6U4GT	0V	0V	*	0V	70VDC	0V	0V	6.3VAC	
V 19	1X2	* DO NOT MEASURE								
V 20	1X2	* DO NOT MEASURE								
V 21	6W4GT	0V	0V	340VDC	0V	320VAC	0V	6.3VAC	0V	
V 22	6W4GT	0V	-1VDC	340VDC	0V	320VAC	0V	6.3VAC	0V	
V 23	12LP4A	0V	70VDC	PIN 10 300VDC	PIN 11 165VDC	PIN 12 6.3VAC				

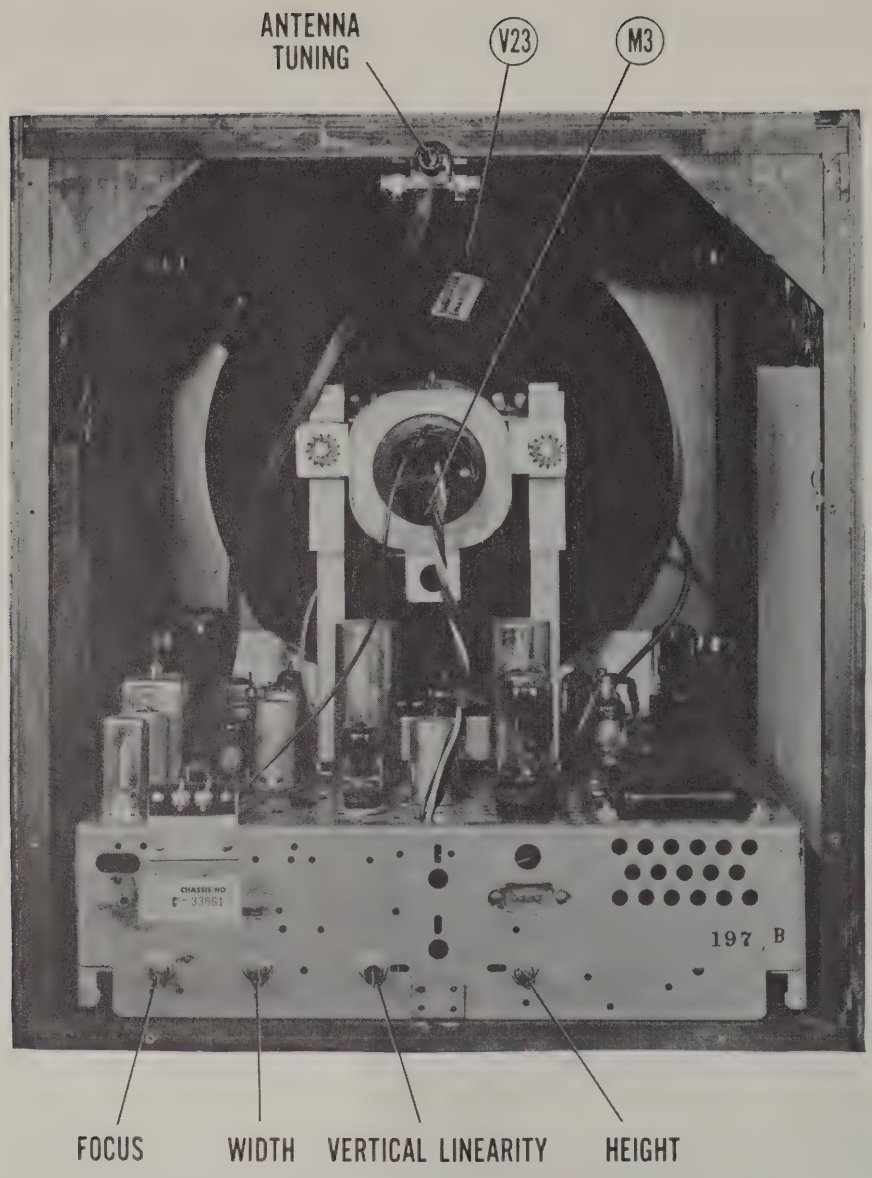
FOCUS CONTROL COUNTER CLOCKWISE.
§ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	560KΩ	100Ω	.1Ω	0Ω	†6.3KΩ	†6.3KΩ	100Ω		
V 2	6J6	†8.8KΩ	†19KΩ	0Ω	.2Ω	220KΩ	22KΩ	0Ω		
V 3	6CB6	600KΩ	100Ω	.1Ω	0Ω	†5.8KΩ	†5.8KΩ	0Ω		
V 4	6CB6	580KΩ	100Ω	.1Ω	0Ω	†5.8KΩ	†5.8KΩ	0Ω		
V 5	6CB6	.9Ω	180Ω	.7Ω	0Ω	†4.1KΩ	†15KΩ	0Ω		
V 6	6AL5	.9Ω	1 Meg.	1.6Ω	0Ω	0Ω	0Ω	4.7KΩ		
V 7	6CB6	4.7KΩ	1.5KΩ	0Ω	.1Ω	†5.2KΩ	†3.1KΩ	0Ω		
V 8	6AU6	47KΩ	0Ω	0Ω	.1Ω	†68KΩ	†68KΩ	0Ω		
V 9	6AL5	Inf.	Inf.	.1Ω	0Ω	0Ω	0Ω	20KΩ		
V 10	6AV6	10 Meg.	0Ω	0Ω	.1Ω	0Ω	0Ω	†270KΩ		
V 11	6K6GT	0Ω	.1Ω	†1.2KΩ	†720Ω	470KΩ	Inf.	0Ω	470Ω	
V 12	6AU6	†24KΩ	†6KΩ	0Ω	.1Ω	330KΩ	†3.1KΩ	†6KΩ		
V 13	12AT7	†19KΩ	15KΩ	0Ω	0Ω	0Ω	†30KΩ	1 Meg.	0Ω	.1Ω
V 14	12AU7	48KΩ	200KΩ	100KΩ	0Ω	0Ω	†100KΩ	40KΩ	1.2KΩ	.1Ω
V 15	12BH6	†700KΩ †1.5 Meg.	390KΩ	1.2KΩ	0Ω	0Ω	†1.7KΩ	2.2 Meg.	5.5KΩ 470Ω	.1Ω
V 16	12AU7	†55KΩ	670KΩ	1.5KΩ	.1Ω	.1Ω	†160KΩ	330KΩ	1.5KΩ	0Ω
V 17	6AU5GT	470KΩ	0Ω	90Ω	Inf.	†850Ω †1.8KΩ	Inf.	.1Ω	†8.3KΩ	
V 18	6U4GT	Inf.	Inf.	†850Ω †1.8KΩ	Inf.	†6.1KΩ	Inf.	0Ω	.1Ω	TOP CAP
V 19	1X2	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	†1.4KΩ †2.4KΩ
V 20	1X2	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP Inf.
V 21	6W4GT	Inf.	Inf.	16KΩ	Inf.	35Ω	Inf.	.1Ω	0Ω	
V 22	6W4GT	Inf.	1.7Ω	16KΩ	Inf.	35Ω	Inf.	.1Ω	0Ω	
V 23	12LP4A	0Ω	18KΩ	PIN 10 †250Ω	PIN 11 60KΩ	PIN 12 .1Ω				

FOCUS CONTROL COUNTER CLOCKWISE
† MEASURED FROM PIN 3 OF V22

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

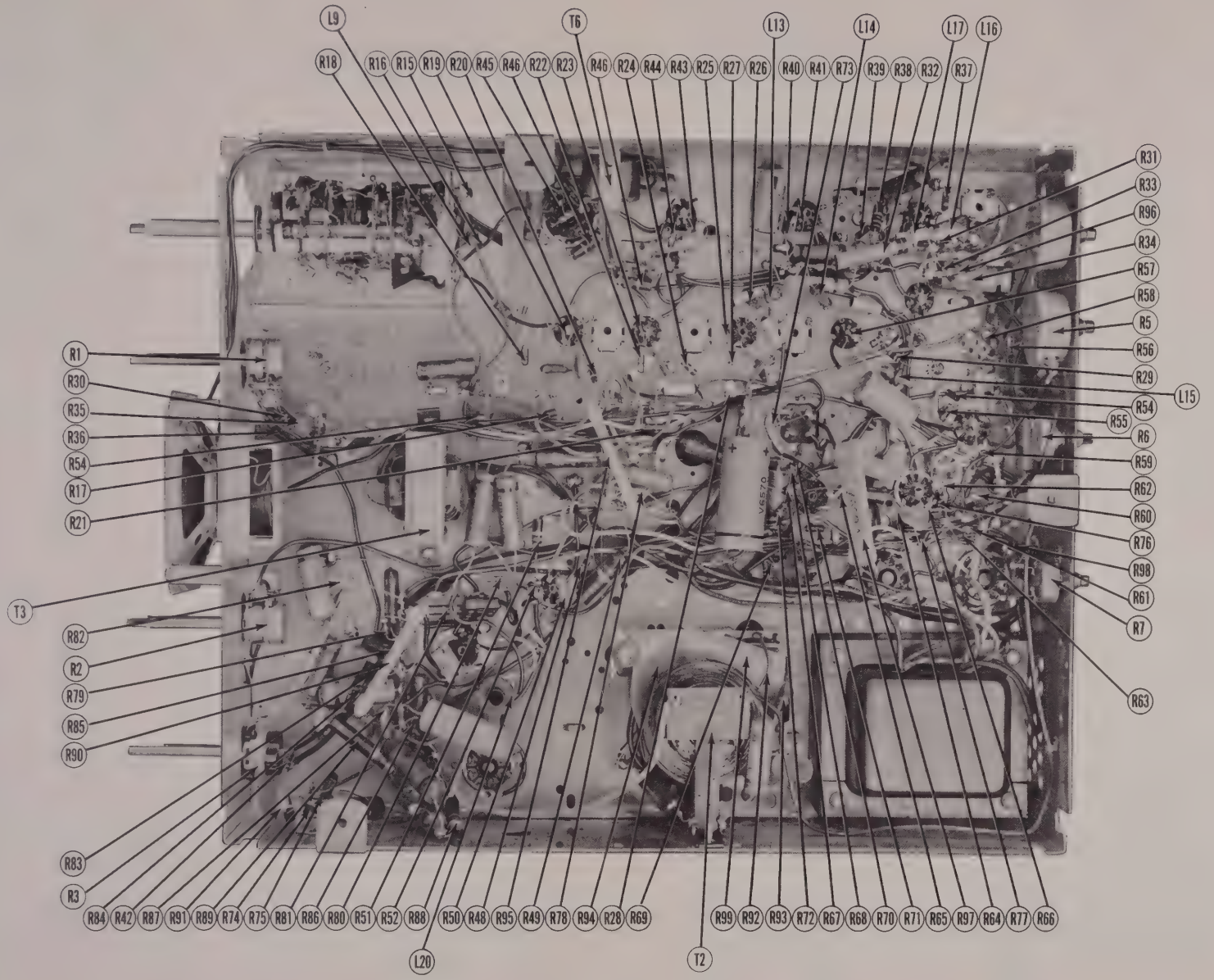
Turn the horizontal hold control to mid-position of its range. Adjust the horizontal ringing coil (B1) until picture synchronizes horizontally.

Adjust the width control until the picture fills the mask horizontally.

DISASSEMBLY INSTRUCTIONS

1. Remove eight push-on type control knobs.
2. Remove seven wood screws from rear cover. Remove rear cover.
3. Disconnect built-in antenna.
4. Remove three 11/16" hex head bolts from bottom of chassis.
5. Remove chassis.

FOR PICTURE TUBE REMOVAL FOLLOW INSTRUCTIONS ABOVE.



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: WESTINGHOUSE Part No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6AG5	6AG5	7BD	
V2	Converter	6J6	6J6	7BF	
V3	1st Video IF	6CB6	6CB6	6CK	
V4	2nd Video IF	6CB6	6CB6	6CK	
V5	3rd Video IF	6CB6	6CB6	6CK	
V6	Video Det.-Noise Limiter	6AL5	6AL5	6BT	
V7	Video Amp.	6CB6	6CB6	6CK	
V8	Sound IF Amp.	6AU6	6AU6	7BK	
V9	Ratio Det.	6AL5	6AL5	6BT	
V10	AF Amp.	6AV6	6AV6	7BT	
V11	Audio Output	6K6GT	6K6GT	7S	
V12	Keyed AGC	6AU6	6AU6	7BK	
V13	Sync. Amp.-Sync. Sep.	12AT7	12AT7	9A	
V14	Vert. Mult.-Hor. AFC	12AU7	12AU7	9A	
V15	Vert. Mult.-Vert. Amp.	12BH7	12BH7	9A	
V16	Hor. Mult.	12AU7	12AU7	9A	
V17	Hor. Output	6AU5GT	6AU5GT	6CK	
V18	Damper	6U4GT	6U4GT	4CG	
V19	HV Rect.	1X2	1X2	7CB	
V20	HV Rect.	1X2	1X2	7CB	
V21	LV Rect.	6W4GT	6W4GT	4CG	
V22	LV Rect.	5W4GT	5W4GT	4CG	
V23	Picture Tube	12LP4A	12LP4A	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: WESTINGHOUSE Part No.	REPLACEMENT DATA: AEROVOX Part No.	REPLACEMENT DATA: CENTRALAB Part No.	REPLACEMENT DATA: CORNELL-DUBILIER Part No.	REPLACEMENT DATA: ERIE Part No.	REPLACEMENT DATA: SPRAGUE Part No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	350	V-6509	AF888130B		UP44435		TVL-4628	▪ Filter
B	40	350				V15			■ Output Dec.
D	150	50							Vert. Amp. Cath.
C2A	80	350	V-5891	AF16222H		UPT81135		TVL-4675	▪ Filter
B	10	350							■ Decoupling
C	10	350							▲ Vert. MV Decoup.
D	10	350							Decoupling
C3	30	450	V-6570	PRS450/30		BR3045A		TVA-1711	Vert. Output Dec.
C4	2	50	V-4880	PRS150/4		BBR2-50T		TVA-1301	Stabilizing Cap.
C5	15			SI15	D6-150		GP1K-15	19C22	RF Coupling
C6	1000			BPD-001	DD-102		811-001	19C1	AGC Filter
C7	1000			BPD-001	DD-102		811-001	19C1	RF Cath. Bypass
C8A	1000			BPD-2 x 001	DD-2-102		882-2 x 0015	29C7	RF Cath. Bypass
B	1000								RF Decoupling
C9	470			SI470.	D6-471		GP2K-470	19C15	RF Plate Dec.
C10	.25								RF Coupling
C11	.5				TCZ-.5				RF Coupling
C12	1.8								RF Coupling
C13	470			SI470	D6-471		GP2K-470	19C15	Mixer Grid Filter
C14	1.5			SII.5NPO	TCZ-1.5		NPOK-1.5		Osc. Coupling
C15	3						N08K-3		Osc. Feedback
C16	10			SII0NPO	TCZ-1.5		NPOK-10	19C3	Osc. Grid Cap.
C17A	1000			BPD-2 x 001	DD-2-102		882-2 x 0015	29C7	RF Bypass
B	1000								Conv. Fil. Bypass
C18	10			SII0NPO	TCZ-10		NPOK-10	19C3	Fixed Trimmer
C19	5000		V-5596	BPD-005	DD-502	1D5D5	811-005	29C1	AGC Filter
C20	5000		V-5596	BPD-005	DD-502	1D5D5	811-005	29C1	Filament Bypass
C21	5000		V-5596	BPD-005	DD-502	1D5D5	811-005	29C1	RF Bypass
C22	150		R5CC21ZY151M	SI150	D6-151	5W5T15	GP2K-150	19C12	IF Coupling
C23	1500		R5CC26ZY152M	SII500	D6-152	1W9D15	GP2L-0015	29C8	AGC Filter
C24	5000		V-5596	BPD-005	DD-502	1D5D5	811-005	29C1	1st V. IF Dec.
C25	1500		R5CC26ZY152M	SII500	D6-152	1W5D15	GP2L-0015	29C8	AGC Filter
C26	.01	400	RCP10W4103M	P488-01	D6-103	PTE4SI	811-01	4TM-SI	AGC Filter
C27	.1	400	RCP10W4104M	P488-1	DF-104	PTE4PI		4TM-P1	AGC Filter
C28	5000		V-5596	BPD-005	DD-502	1D5D5	811-005	29C1	2nd V. IF Decoup.
C29	1500		R5CC26ZY152M	SII500	D6-152	1W5D15	GP2L-0015	29C8	RF Bypass
C30	5000		V-5596	BPD-005	DD-502	1D5D5	811-005	29C1	3rd V. IF Screen
C31	1500		R5CC26ZY152M	SII500	D6-152	1W5D15	GP2L-0015	29C8	3rd V. IF Cath.
C32	5000		V-5596	BPD-005	DD-502	1D5D5	811-005	29C1	3rd V. IF Plate Dec.
C33	1500		R5CC26ZY152M	SII500	D6-152	1W5D15	GP2L-0015	29C8	3rd V. IF Fil.
C34	4.7		V-5658-6	SI5	TCZ-4.7	5W5V5	GP1K-5	MS-55	V. Diode Filter
C35	.1	400	RCP10W4104M	P488-1	DF-104	PTE4PI		4TM-P1	Video Coupling
C36	1500		R5CC26ZY152M	SII500	D6-152	1W5D15	GP2L-0015	29C8	V. Det. Fil.
C37	.1	400	RCP10W4104M	P488-1	DF-104	PTE4PI		4TM-P1	Pic. Tube Grid Filter
C38	47	500	RCM20B470M	1468-00005	D6-470	5W5Q5	GP1K-47	1FM-45	S. IF Coupling
C39	.01	400	RCP10W4103M	P488-01	D6-103	PTE4SI	811-01	4TM-SI	S. IF Decoup.
C40	680	500	RCM20B681M	SI680	D6-681	1W5T7	GP2K-680	19C17	Diode Load Cap.
C41	.002	600	RCP10W6202M	P688-002	D6-202	PTE6D2	GP2M-002	6TM-D2	De-emphasis
C42	.01	400	RCP10W4103M	P488-01	D6-103	PTE4SI	811-01	4TM-SI	Audio Coupling
C43	.005	400	RCP10W4502M	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Tone Comp.
C44	100	500	RCM20B101M	1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	Tone Comp.
C45	.01	400	RCP10W4103M	P488-01	D6-103	PTE4SI	811-01	4TM-SI	Audio Coupling
C46	270	500	RCM20B271M	1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	AF Amp. Plate
C47	.01	400	RCP10W4103M	P488-01	D6-103	PTE4SI	811-01	4TM-SI	Audio Coupling
C48	.002	600	RCP10W6202M	P688-002	D6-202	PTE6D2	GP2M-002	6TM-D2	Output Plate Byp.
C49	5000		V-5596	BPD-005	DD-502	1D5D5	811-005	29C1	Keyed AGC Cath.
C50	330	500	RCM20C331K	1468-00035	D6-331	5W5T3	GP2K-330	1FM-335	Hor. Sweep Coupling
C51	150	500	RCM20B151M	1468-00015	D6-151	5W5T15	GP2K-150	1FM-315	Sync. Amp. Plate
C52	.25	400	V-6066-4254M	P488-25		GT4P25		4TM-P25	Sync. Coupling
C53	270	500	RCM20B271M	1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	Sync. Coupling
C54	.01	400	RCP10W4103M	P488-01	D6-103	PTE4SI	811-01	4TM-SI	Sync. Coupling
C55A	2000		▪ V-9213	P688-002	PC-100 *	PTE6D2	GP2M-002	6TM-D2	Integrator Net.
B	5000			P688-005		PTE6D5	811-005	6TM-D5	Integrator Net.
C	5000			P688-005		PTE6D5	811-005	6TM-D5	Integrator Net.
C56	.05	400	RCP10W4503M	P488-05	DF-503	PTE4S5		4TM-S5	Vert. MV Cath.
C57	.01	400	V-6023-4103K	P488-01		PTE4SI		4TM-SI	Vert. MV Feedback

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: WESTINGHOUSE Part No.	REPLACEMENT DATA: AEROVOX Part No.	REPLACEMENT DATA: CENTRALAB Part No.	REPLACEMENT DATA: CORNELL-DUBILIER Part No.	REPLACEMENT DATA: ERIE Part No.	REPLACEMENT DATA: SPRAGUE Part No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C58	.1	400	V-6023-4104K	P488-1		PTE4P1		4TM-P1	Vert. Discharge
C59	.1	400	RCP10W4104M	P488-1	DF-104	PTE4P1		4TM-P1	Vert. Sweep Coupling
C60	100	500	RCM20B101M	1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	Sync. Coupling
C61	470	500	RCM20B471K	1468-0005	D6-471	5W5T5	GP2K-470	1FM-35	Hor. AFC Plate
C62	330	500	RCM20C331K	1468-00035	D6-331	5W5T3	GP2K-330	1FM-335	Hor. Feedback
C63	.005	400	RCP10W4502M	P688-005	D6-502	PTE6D5	811-005	6TM-D5	AFC Filter
C64	.05	400	RCP10W4503M	P488-05	DF-503	PTE4S5		4TM-S5	AFC Filter
C65	.001	600	RCP10W6102K	P688-001	D6-102	PTE6D1	GP2L-001	6TM-D1	Hor. MV Cath.
C66	680	500	RCM20B681K	SI680	D6-681	1W5T7	GP2K-680	1FM-37	Hor. MV Feedback
C67	3900	500	RCM20C392K	1464-004		1DR5D4		MS-24	Fixed Trimmer
C68	.1	400	RCP10W4104M	P488-1	DF-104	PTE4P1		4TM-P1	Hor. MV Decoupling
C69	.1	400	RCP10W4104M	P488-1	DF-104	PTE4P1		4TM-P1	Hor. MV Decoupling
C70	.1	400	RCP10W4104M	P488-1	DF-104	PTE4P1		4TM-P1	Hor. Hold Cont. Byp.
C71	680	500	RCM20B681K	SI680	D6-681	1W5T7	GP2K-680	1FM-37	Hor. Discharge
C72	330	500	RCM20C331K	1468-00035	D6-331	5W5T3	GP2K-330	1FM-335	Hor. Discharge †
C73	100	500	RCM20B101M	1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	Hor. MV Plate Byp.
C74	.01	400	RCP10W4103M	P488-01	D6-103	PTE4SI	811-01	4TM-SI	Hor. Sweep Coupling
C75	270	500	RCM20B271M	1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	Hor. Output Grid
C76	.1	400	RCP10W4104M	P488-1	DF-104	PTE4P1		4TM-P1	Hor. Output Screen
C77	.1	400	RCP10W4104M	P488-1	DF-104	PTE4P1		4TM-P1	Hor. Output Cath.
C78	100	1000	V-9792-10101K	1469-HV-0001					Hor. Output Plate Byp
C79	.25	400	RCP10W4254M	P488-25		GT4P25		4TM-P25	Damper Plate Byp.
C80	.1	400	V-6023-4104M	P488-1	DF-104	PTE4P1		4TM-P1	Hor. Sweep Coupling
C81	.1	400	RCP10W4104M	P488-1	DF-104	PTE4P1		4TM-P1	Decoupling
C82	.001	6000	V-9571-1	P6088-001		PTE6D01		TVM-216	HV Filter
C83	.001	6000	V-9571-1	P6088-001		PTE6D01		TVM-216	HV Filter
C84	.001	6000	V-9571-1	P6088-001		PTE6D01		TVM-216	Voltage Doubler Cap.

* Items C55A, C55B, C55C, R64A, R64B and R64C are combined into one unit.
† Not used in all models.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: WESTING. Part No.	REPLACEMENT DATA: IRC Part No.	REPLACEMENT DATA: CLAROSTAT Part No.	REPLACEMENT DATA: CENTRALAB Part No.	INSTALLATION NOTES
R1A	50KΩ	1/2	V-9235-2		RTV-56	SBB-513	Brightness control-front
B	1500Ω	1/2					Contrast control-rear
R2A	500KΩ	1/2		Concentrikit			
B	100KΩ	1/2	V-9233	B11-133 *	RTV-57	SBB-514	Vert. hold control-front
C	Shaft End	1/2		B11-128 *			Horiz. hold control-rear
				E-202 *			Attach per instr. in "Concentrikit".
R3A	500KΩ	1/2	V-6198-4	Q13-133X	AK-80	BT-66-S	Volume control, tapped at 100KΩ
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R3A per instructions
C	Switch		Not Req.	76-1	SWB	Not. Req.	Attach to R3A per instructions
R4	1000Ω	4	V-9612-1		RTV-119	VK-129	Focus control-Wire Wound
R5	1000Ω	4	V-9612-1		RTV-119	VK-129	Width control-Wire Wound
R6A	5000Ω	1/2	V-6463	Q11-114	AG-19-S	AN-10	Vert. linearity control
B	Shaft		Not Req.	RQ	FSK-1/4	AK-1	Attach to R6A per instructions
R7A	1 Meg.	1/2	V-9813-1	Q11-137	AG-61-S	AN-69	Height control
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Attach to R7A per instructions

* Additional parts to be used with "Concentrikit".

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: WESTINGHOUSE Part No.	REPLACEMENT DATA: IRC Part No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED
R8	2200Ω 20%	1		BTS-2200	RF Amp. Grid-See Note 1
R9	100Ω 20%	1		BTS-100	RF Amp. Cathode
R10	2200Ω 20%	1		BTS-2200	RF Amp. Decoupling-See Note 2
R11	220KΩ 20%	1			Mixer Grid-See Note 3
R12	15KΩ 20%	1			Mixer Plate
R13	4700Ω	1		BTS-4700	Osc. Plate
R14	22KΩ 20%	1		BTS-22K	Osc. Grid
R15	10KΩ 20%	1		BTS-10K	AGC Network
R16	1000Ω 20%	1		BTS-1000	Decoupling
R17	10KΩ 20%	1	RC20AE103M	BTS-10K	AGC Network
R18	12KΩ	1	RC20AE123K	BTS-12K	1st Video IF Grid
R19	100Ω	1	RC20AE101K	BTS-100	1st Video IF Cathode
R20	2700Ω	1	RC20AE272K		1st Video IF Decoupling
R21	10KΩ 20%	1	RC20AE103M	BTS-10K	AGC Network
R22	5600Ω	1	RC20AE562K	BTS-5600	2nd Video IF Transformer Shunt
R23	100Ω	1	RC20AE101K	BTS-100	2nd Video IF Cathode
R24	2700Ω	1	RC20AE272K		2nd Video IF Decoupling
R25	12KΩ	1	RC20AE123K	BTS-12K	3rd Video IF Transformer Shunt
R26	180Ω	1	RC20AE181K	BTS-180	3rd Video IF Cathode
R27	12KΩ	1	RC20AE123K	BTS-12K	3rd Video IF Screen
R28	1000Ω 20%	1	RC20AE102M	BTS-1000	3rd Video IF Plate Decoupling
R29	4700Ω	1	RC20AE472K	BTS-4700	Video Detector Diode Load
R30	47Ω	1	RC20AE470K	BW-1-47	Video Amp. Cathode
R31	33KΩ	1	RC20AE333K	BTS-33K	Peaking Coil Shunt
R32	5100Ω 5%	2	RC40AE512J	BTB-4700-5%	Video Amp. Plate
R33	100KΩ	1	RC20AE104K	BTS-100K	Voltage Divider
R34	150KΩ	1	RC20AE154K	BTS-150K	Picture Tube Cathode
R35	22KΩ	1	RC20AE223K	BTS-22K	Voltage Divider-See Note 4
R36	33KΩ 20%	1	RC20AE333M	BTS-33K	Voltage Divider-See Note 5
R37	47KΩ	1	RC20AE473K	BTS-47K	Sound IF Grid
R38	68KΩ	1	RC30AE683K	BTA-68K	Sound IF Decoupling
R39	33KΩ	1	RC20AE333K	BTS-33K	De-emphasis
R40	10KΩ 20%	1	RC20AE103M	BTS-10K	Ratio Detector Diode Load
R41	10KΩ 20%	1	RC20AE103M	BTS-10K	Ratio Detector Diode Load
R42	22KΩ	1	RC20AE223K	BTS-22K	Tone Compensation
R43	10 Meg. 20%	1	RC20AE106M	BTS-10 Meg.	AF Amp. Grid
R44	270KΩ	1	RC20AE274K	BTS-270K	AF Amp. Plate
R45	470KΩ	1	RC20AE474K	BTS-470K	Audio Output Grid

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: WESTINGHOUSE Part No.	REPLACEMENT DATA: IRC Part No.	IDENTIFICATION CODES
R46	470Ω	1	RC30AE471K	BTA-470	Audio Output Cathode
R47	470Ω	1	RC30AE471K	BTA-470	Audio Output Decoupling
R48	4700Ω	1/2	RC30AE472K	BTS-4700	AGC Amp. Grid
R49	10KΩ	2	RC40AE103K	BTB-10K	AGC Amp. Cathode
R50	3300Ω	1	RC30AE332K	BTA-3300	Voltage Divider
R51	330KΩ 20%	1	RC30AE334K	BTA-330K	Voltage Divider
R52	220KΩ 20%	1/2	RC20AE224M	BTS-220K	AGC Network
R53	10KΩ 20%	1	RC20AE103M	BTS-10K	AGC Network
R54	10KΩ 20%	1/2	RC20AE103M	BTS-10K	Isolation
R55	1 Meg.	1/2	RC20AE105K	BTS-1 Meg.	Voltage Divider
R56	15KΩ	1/2	RC20AE153K	BTS-15K	Sync. Amp. Plate
R57	1 Meg.	1/2	RC20AE105K	BTS-1 Meg.	Noise Limiter Diode Load
R58	470KΩ	1/2	RC20AE474K	BTS-470K	Current Limiting
R59	1 Meg.	1/2	RC20AE105K	BTS-1 Meg.	Sync. Sep. Grid
R60	150KΩ	1/2	RC20AE154K	BTS-150K	Sync. Sep. Plate
R61	22KΩ	1/2	RC20AE223K	BTS-22K	Voltage Divider
R62	47KΩ	1/2	RC20AE473K	BTS-47K	Voltage Divider
R63	1500Ω	1/2	RC20AE152K	BTS-1500	Voltage Divider
R64A	22KΩ	1/2			Integrating Network
B	8200Ω	1/2	V-9213 *		Integrating Network
C	8200Ω	1/2			Integrating Network
R65	1200Ω	1/2	RC20AE122K	BTS-1200	Vert. MV Cathode
R66	100KΩ	1/2	RC20AE104K	BTS-100K	Vert. MV Plate
R67	390KΩ	1/2	RC20AE394K	BTS-390K	Vert. MV Grid
R68	390KΩ	1/2	RC20AE394K	BTS-390K	Vert. MV Plate
R69	470KΩ	1/2	RC20AE474K	BTS-470K	Vert. MV Plate Decoupling-See Note 6
R70	3300Ω	1/2	RC20AE332K	BTS-3300	Vert. Peaking
R71	2.2 Meg. 20%	1/2	RC20AE225M	BTS-2.2 Meg.	Vert. Output Grid
R72	470Ω	1/2		BTS-470	Vert. Output Cathode
R73	1000Ω 20%	1/2	RC20AE102M	BTS-1000	Vert. Output Decoupling
R74	91KΩ 5%	1	RC30AE913J		Hor. Feedback
R75	91KΩ 5%	1	RC30AE913J		Hor. Feedback
R76	100KΩ	1/2	RC20AE104K	BTS-100K	Hor. AFC Grid
R77	100KΩ	1/2	RC20AE104K	BTS-100K	Hor. AFC Cathode
R78	470KΩ	1/2	RC20AE474K	BTS-470K	Hor. AFC Filter
R79	1500Ω	1/2	RC20AE152K	BTS-1500	Hor. MV Cathode
R80	5600Ω	1/2	RC20AE562K	BTS-5600	Hor. MV Plate
R81	47KΩ 20%	1	RC30AE473M	BTA-47K	Hor. MV Plate Decoupling
R82	330KΩ	1	RC30AE334K	BTA-330K	Hor. MV Grid
R83	150KΩ	1/2	RC20AE154K	BTS-150K	Hor. MV Plate
R84	10KΩ 20%	1/2	RC20AE103M	BTS-10K	Hor. MV Plate Decoupling
R85	27KΩ	1/2	RC20AE273K	BTS-27K	Hor. Peaking
R86	120Ω 20%	1/2	RC20AE121M		Parasitic Suppressor
R87	470KΩ	2	RC30AE474K	BTS-470K	Hor. Output Grid
R88	91Ω	2	V-9002-4900K		Hor. Output Cathode-Wire Wound
R89	8200Ω	2	V-9002-4822K	BTB-8200	Hor. Output Screen-Wire Wound
R90	6KΩ	10	V-9600-2	1 3/4A-6K	Damper Filter-Wire Wound
R91	91KΩ 5%	1	RC30AE913J		Hor. Feedback
R92	510KΩ 5%	1	V-9016-2514J		HV Rect. Load
R93	510KΩ 5%	1	V-9016-2514J		HV Rect. Load
R94	100KΩ	1/2	RC20AE104M		HV Filter
R95	3KΩ	10	V-9600-5	1 3/4A-3K	Voltage Divider-Wire Wound
R96	190Ω	3	V-5134		Focus Coil Shunt-Wire Wound
R97	50Ω	10	V-6597		Surge Limiter-Wire Wound
R98	220KΩ 20%	1	RC30AE224M	BTA-220K	Line Isolation
R99	510Ω 5%	1	V-9016-2514J		HV Rect. Load-See Note 7

Note 1. Some models use 1000Ω resistor in this application.
Note 2. Some models use 4700Ω resistor in this application.
Note 3. Some models use 270KΩ resistor in this application.
Note 4. Some models use 6800Ω resistor in this application.
Note 5. Some models use 22KΩ resistor in this application.
Note 6. Some models use 100KΩ resistor in this application.
Note 7. Not used in all models.
▪ Items C55A, C55B, C55C, R64A, R64B, and R64C are combined into one unit.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: WESTINGHOUSE Part No.	REPLACEMENT DATA: STANCOR Part No.	REPLACEMENT DATA: MERIT Part No.	REPLACEMENT DATA: CHICAGO Part No.
T1	117VAC	680VCT	12.6VCT		V-9723			
	① 1.8A	.250ADC	② 5 5A					

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: WESTINGHOUSE Part No.	REPLACEMENT DATA: STANCOR Part No.	REPLACEMENT DATA: MERIT Part No.	REPLACEMENT DATA: CHICAGO Part No.	NOTES
T2	690Ω	0Ω	V-9759			TFB-3	HV Trans.
	Tap ②	SEC. 2					
	89Ω	0Ω					
T3	650Ω	8.7Ω	V-9584-1	A-8113	A-3036	TSO-5 ①	Vert. Output Trans.
T4A	37Ω		V-9210-2				Hor. Deflection Yoke
B	68Ω						Vert. Deflection Yoke
T5	245Ω		V-9590-1	FC-10 ①	MF-1		Focus Coil

① Solder brackets on case.

PARTS LIST CONTINUED ON PAGE 15

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		WESTING. PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T6	7100Ω	3.8Ω	485Ω	.7Ω	V-9238	A-3878	A-2931	RO-13	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	WESTINGHOUSE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	PM	3.8Ω	V-9236-2		4E68S	
	CONE DIA.	V. C. DIA.				
SP2	4"	9/16"				

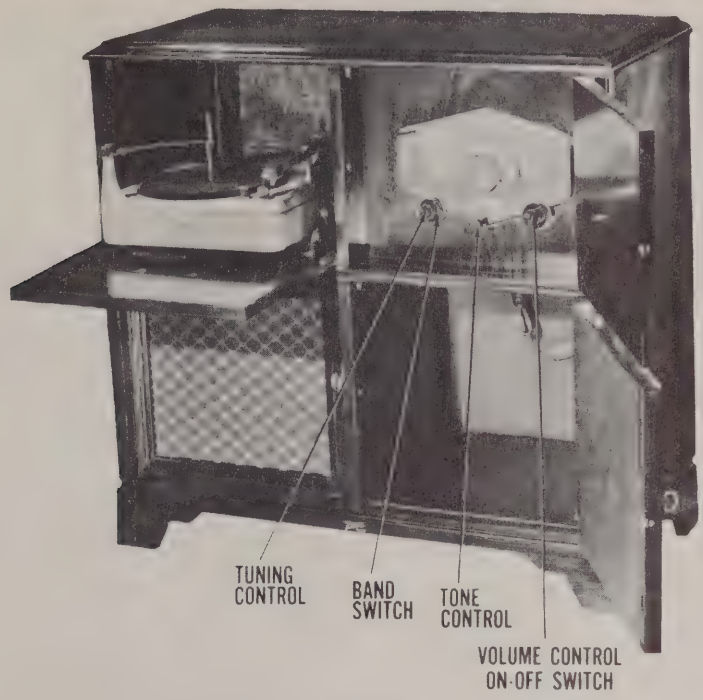
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	WESTINGHOUSE PART No.	MEISSNER PART No.	IRC PART No.	
L1	Ant. Coil	0Ω		*			* Part of tuner #V-8210
L2	Ant. Coil	0Ω		*			
L3	RF Coil	0Ω		*			
L4	Mixer Grid Coil	0Ω		*			
L5	Osc. Coil	0Ω		*			Channel 6
L6	Osc. Coil	0Ω		*			Channel 13
L7	Fil. Choke	.1Ω		*		CLA-.47	.47 microhenries
L8	1st Video IF	.5Ω		*			
L9	Fil. Choke	.7Ω		V-9099-1		CLA-1.5	1.5 microhenries
L10	2nd Video IF	.9Ω	.9Ω	V-9798			
L11	3rd Video IF	.9Ω	.9Ω	V-9798			
L12	4th Video IF	.9Ω	.9Ω	V-9798			
L13	Fil. Choke	.7Ω		V-9099-1		CLA-1.5	1.5 microhenries
L14	Fil. Choke	1.8Ω		V-9099-2		CLA-3.3	3.3 microhenries
L15	Peaking	4.7Ω		V-5902-4			
L16	Peaking	5.5Ω		V-5902-1			
L17	Peaking	5.5Ω		V-5902-1			
L18	Sound IF	2.4Ω	2.4Ω	V-9371			
L19	Ratio Det. Trans.	5.2Ω	.4Ω	V-9574			
L20	Ringing Coil	100Ω		V-6764			

MISCELLANEOUS

ITEM No.	PART NAME	WESTINGHOUSE PART No.	NOTES
M1	RF Tuner	V-8210	
M2	Fuse	V-6171-4	.5A 250V Type GJV
M3	Ion Trap	V-9784-1	
	Safety Glass	V-6288-11	
	Cabinet	V-1209-2	
	Knob	V-6284-6	Channel selector
	Knob	V-9104-4	Fine tuning
	Knob	V-6146-5	Volume (front)
	Knob	V-9104-3	Volume (rear)
	Knob	V-9104-1	Brightness, Vert. hold
	Knob	V-6146-1	Contrast, Horiz. hold
	Knob	V-5100-1	TV antenna
	Antenna Assembly	V-9366-2	

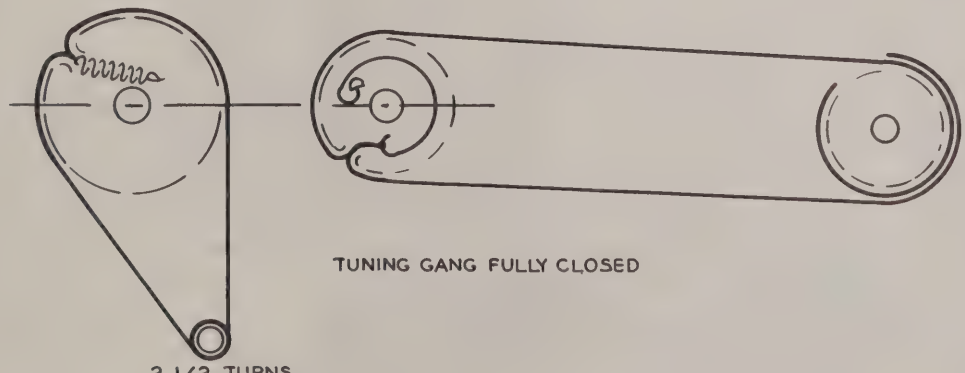
ZENITH
MODEL H880RZ (Ch. 8H20)



ZENITH MODEL H880RZ

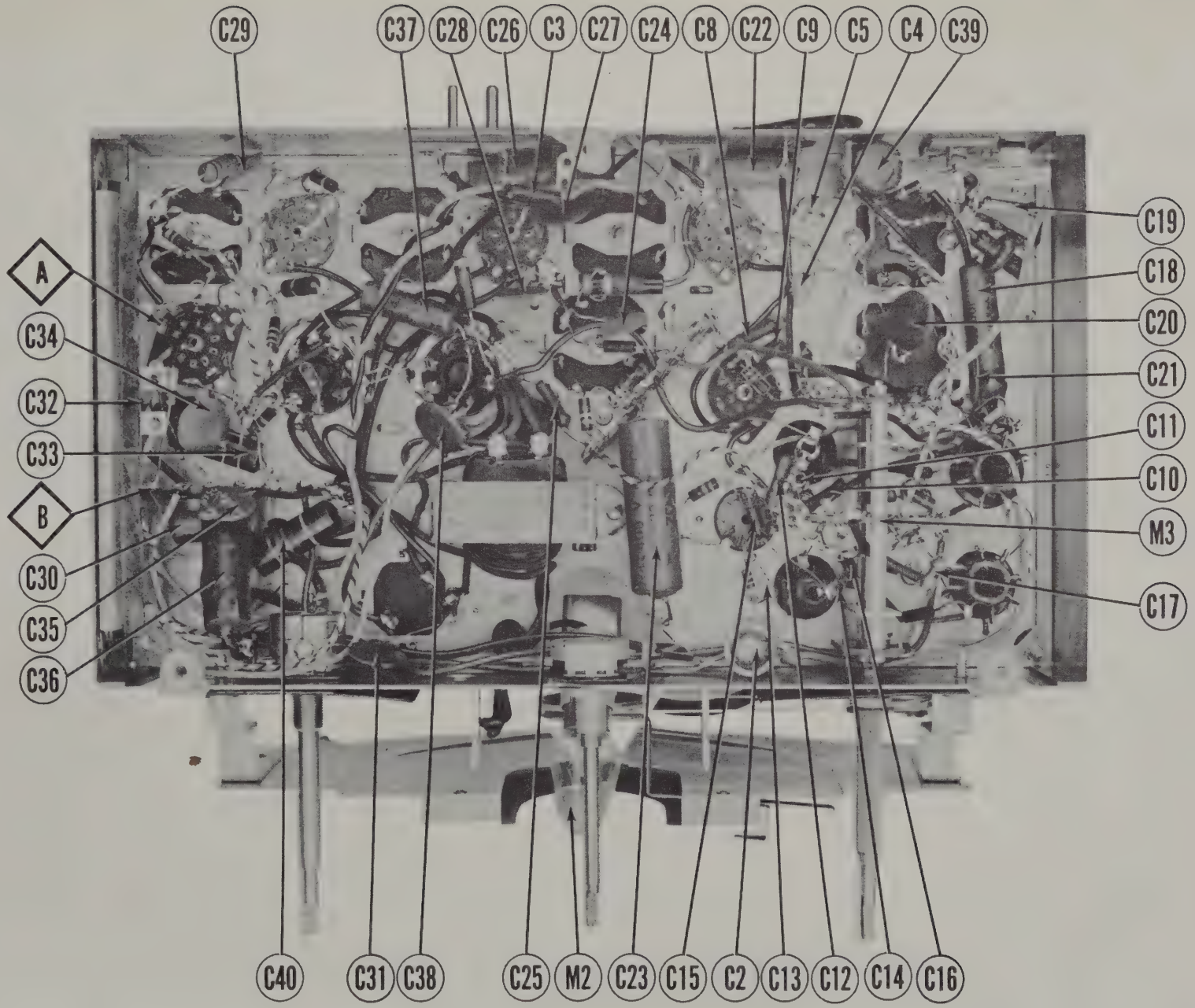
TRADE NAME	Zenith, Model H880RZ (Ch. 8H20)		
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago, Illinois		
TYPE SET	AC Operated Combination Phono-Radio, AM-FM Superheterodyne Receiver with Loop Antenna		
TUBES (EIGHT)	Types 12BA6 RF Amp., 12AT7 Converter, 12BA6 1st FM-AM IF Amp., 12BA6 2nd FM IF Amp., 12AU6 Limiter, 19T8 Disc.-DET-AVC-AF, 25L6GT Power Output, 25Z5GT Rectifier		
POWER SUPPLY	110-120 Volts AC	RATING	.66 Amp. at 117 Volts AC
TUNING RANGE-BROADCAST	540-1620KC	FREQ. MOD.	88-108MC

FOR SERVICE INFORMATION ON RECORD CHANGER SEE ZENITH MODEL S-14025 IN PHOTFACT SET # 112 FOLDER # 15 OR RECORD CHANGER MANUAL CM-3



DIAL CORD DRIVE

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis 1, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America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C12
C14
C16

R26
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R22
R21
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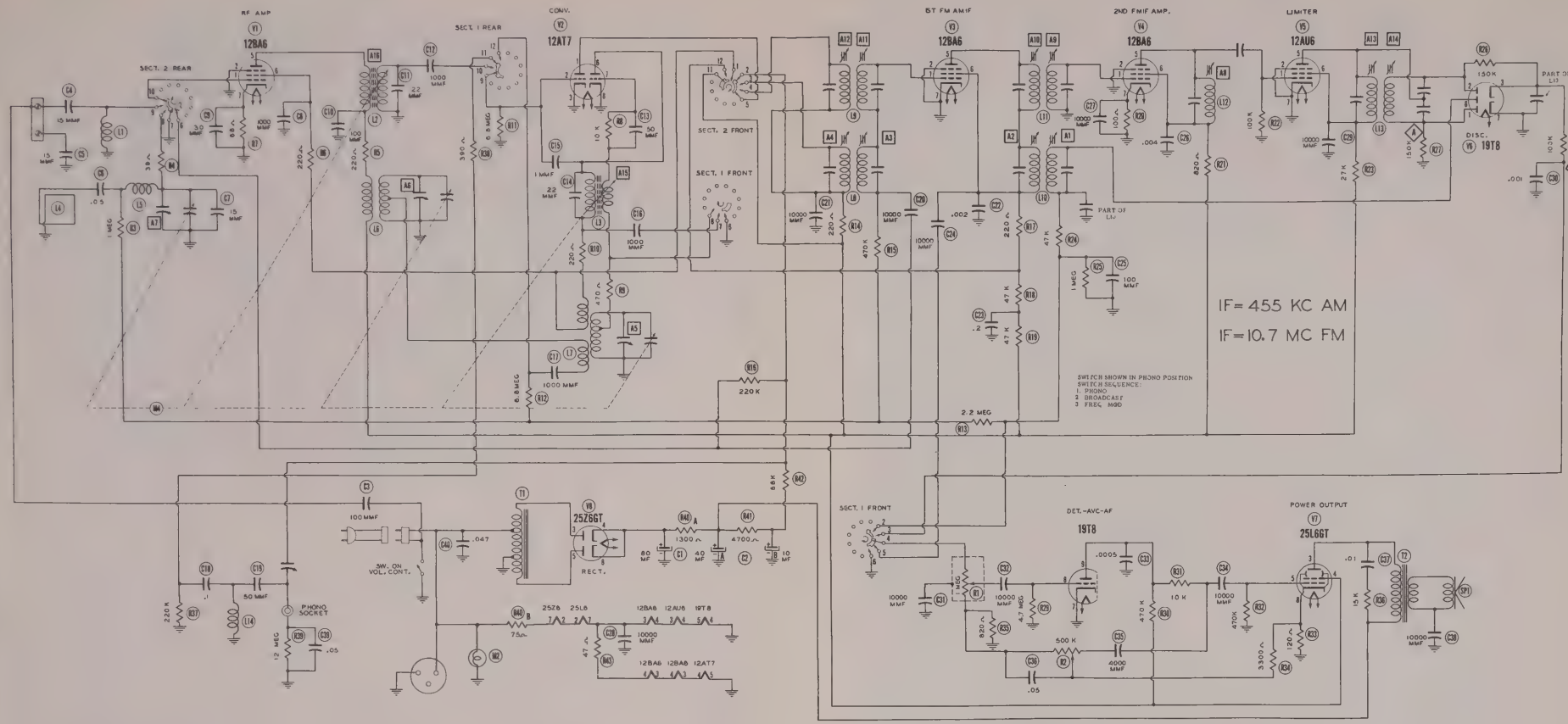
R10



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12BA6	90V ▲-1.1VDC	0V	1.4VAC	26VAC	†105VDC ▲110VDC	†105VDC ▲110VDC	†1.2VDC ▲.9VDC		
V 2	12AT7	†100VDC ▲115VDC	†1.7VDC ▲-2VDC	0V	1.4VAC	0V	†105VDC ▲115VDC	†1.2 VDC ▲-3.1VDC	0V	6.3VAC
V 3	12BA6	-.6VDC	0V	26VAC	38VAC	†105VDC ▲110VDC	†105VDC ▲110VDC	0V		
V 4	12BA6	0V	0V	45VAC	33VAC	100VDC	100VDC	1.4VDC		
V 5	12AU6	†-.5VDC	0V	33VAC	20VAC	†65VDC	†65VDC	0V		
V 6	19T8	†-1VDC ▲-.6VDC	†1VDC ▲.6VDC	†1.3VDC ▲0V	0V	20VAC	-.7VDC	0V	-.7VDC	45VDC
V 7	25L6GT	0V	72VAC	175VDC	115VDC	0V	170VDC	45VAC	6.6VDC	
V 8	25Z6GT	0V	72VAC	175VAC	185VDC	180VAC	115VDC	95VAC	185VDC	

‡ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12BA6	‡ 1Ω ▲3 Meg.	0Ω	15Ω	18Ω	‡1.5KΩ	‡1.5KΩ	68Ω ▲10.5KΩ		
V 2	12AT7	‡1.5KΩ ▲3.8 Meg.	‡6.8 Meg. ▲3.8 Meg.	0Ω	15Ω	0Ω	‡1.5KΩ		0Ω	5Ω
V 3	12BA6	‡2.5 Meg ▲2.2 Meg.	0Ω	18Ω	23Ω	‡1.5KΩ	‡1.5KΩ	0Ω		
V 4	12BA6	.4Ω	0Ω	33Ω	39Ω	‡2.1KΩ	‡2.1KΩ	100Ω		
V 5	12AU6	100KΩ	0Ω	20Ω	18Ω	‡28KΩ	‡28KΩ	0Ω		
V 6	19T8	‡140KΩ ▲150KΩ	‡140KΩ ▲150KΩ	‡270KΩ ▲300KΩ	0Ω	16Ω	‡850KΩ ▲900KΩ	0Ω	4.7 Meg.	‡470KΩ
V 7	25L6GT	0Ω	38Ω	‡235Ω	‡1.3KΩ	470KΩ	115KΩ	33Ω	120Ω	
V 8	25Z6GT	0Ω	38Ω	110Ω	40KΩ	50Ω	‡1.3KΩ	35Ω	40KΩ	

† TAKEN IN FM POSITION
▲ AM POSITION
‡ MEASURED FROM PIN 4 OF V8

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning gang fully closed and set pointer to round dot at the low frequency end of the "AM" dial scale.
The type of IF transformers used in this receiver must be aligned using an alignment wrench, Zenith Part #68-7. The upper coil is the secondary and the lower coil is the primary.

AM ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to pin 2 (Grid) of 12AT7 (V2). Low side to chassis.	455KC (400 ∿ Mod.)	AM (1st position CW)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1600KC	"	Set pointer to 1600KC on dial scale	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		Loop	1400KC	"	Tune for max. output	"	A6, A7	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.05MFD	High side to pin 2 (Grid) of 12AT7 (V2). Low side to chassis.	10.7MC (Unmod.)	FM (fully CW)	Tuning gang fully open	DC Probe thru 100KΩ to pin 1 (Grid) of 12AU6 (V5). Common to chassis.	A8, A9, A10, A11, A12	Adjust for maximum deflection. Attenuate signal generator to maintain a maximum 2 volts reading.
5.	.05MFD	"	"	"	"	DC Probe thru 100KΩ to Point (A). Common to chassis.	A13	"
6.	.05MFD	"	"	"	"	DC Probe to Point (B). Common to chassis.	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	.05MFD	High side to pin 2 (Grid) of 12AT7 (V2). Low side to chassis.	10.7MC (450KC SWP)	FM (fully CW)	Tuning gang fully open	Vert. Amp. thru 100KΩ to pin 1 (Grid) fof 12AU6 (V5) Low side to chassis.	A8, A9, A10, A11, A12	Adjust for maximum amplitude and symmetry as per figure 1.
6.	.05MFD	"	"	"	"	Vert. Amp. to Point (B). Low side to chassis.	A13, A14	Adjust A14 to place 10.7MC at center of diagonal line as per figure 2. Adjust A13 for maximum amplitude and straightness of diagonal line. Continue with step 7.

FM RF ALIGNMENT

Remove the line antenna from the FM antenna terminal.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	270Ω carbon res.	High side thru 270Ω to "FM" antenna terminal "F". Low side to chassis.	98MC (Unmod.)	FM (fully CW)	Set pointer to 98MC on dial scale.	DC Probe thru 100KΩ to pin 1 (Grid) of 12AU6 (V5). Common to chassis.	A15, A16	Adjust for maximum deflection.

FIG. 1

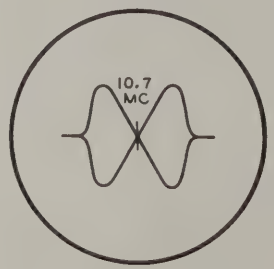


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	RF Amp.	12BA6	12BA6	7BK	
V2	Converter	12AT7	12AT7	9A	
V3	1st FM-AM IF Amp.	12BA6	12BA6	7BK	
V4	2nd FM IF Amp.	12BA6	12BA6	7BK	
V5	Limiter	12AU6	12AU6	7BK	
V6	Discr.-Det.-AVC -AF	19T8	19T8	9E	
V7	Power Output	25L6GT	25L6GT	7AC	
V8	Rectifier	25Z5GT	25Z5GT	6E	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

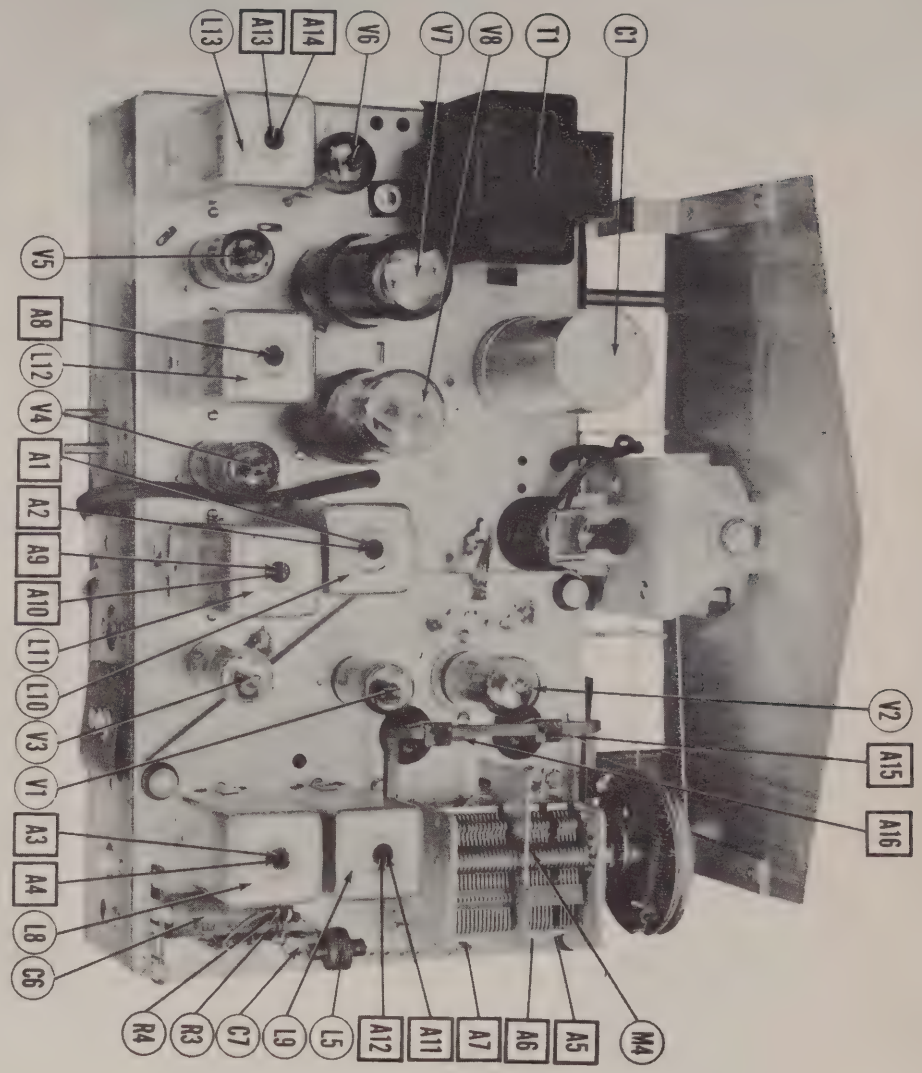
ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	80	250	22-2105	AF888J		UPE8425		TVL-2582	▪ Filter
B	40	250							▲ Filter
C2	10	250	22-2154	PRS250/12		BR1025		TVA-1505	Filter
C3	100		22-5	SI100	D6-101	5W5T1	GP1K-100	19C11	Line Ant. Coupling
C4	15		22-2140	SI15	D6-150	5W5Q2	GP1K-15	19C22	Ant. Coupling
C5	15		22-2140	SI15	D6-150	5W5Q2	GP1K-15	19C22	Ant. Isolation
C6	.05	600	22-829	P688-05	DF-503	PTE6S5		6TM-S5	Ant. Isolation
C7	15		22-2140	SI15	D6-150	5W5Q2	GP1K-15	19C22	Fixed Trimmer
C8	1000		22-1676	SI1000	D6-102	1W5D1	GP2L-001	19C1	RF Amp. Screen
C9	30		22-1705	SI33	D6-330	5W5Q3	GP1K-30	19C24	RF Amp. Cath.
C10	100		22-5	SI100	D6-101	5W5T1	GP1K-100	19C11	RF Amp. Plate Dec.
C11	22		22-1506				N080-331-22		Fixed Trimmer
C12	1000		22-1676	SI1000	D6-102	1W5D1	GP2L-001	19C1	RF Coupling
C13	50		22-1367	SI50	D6-500	5W5Q5	GP1K-50	19C28	Osc. Grid Cap.
C14	ZZ		22-1506				N080-331-22		Fixed Trimmer
C15	1		22-1762		TCZ-1				Osc. Coupling
C16	1000		22-1676	SI1000	D6-102	1W5D1	GP2L-001	19C1	Osc. Plate Dec.
C17	1000		22-1676	SI1000	D6-102	1W5D1	GP2L-001	19C1	Isolation
C18	.1	200	22-827	P288-1	DF-104	PTE4P1		2TM-P1	Phono Osc. Grid
C19	50		22-1367	SI50	D6-500	5W5Q5	GP1K-50	19C28	Phono Osc. Feedback
C20	10000		22-3	BPD-01	DD-103	PTE4S1	811-01	36C1	AVC Filter
C21	10000		22-3	BPD-01	DD-103	PTE4S1	811-01	36C1	Conv. Plate Dec.
C22	.002	600	22-1220	P688-002	D6-202	PTE6D2	GP2M-002	6TM-D2	1st IF Dec.
C23	.2	400	22-177	P488-22		GT4P2		4TM-P22	1st IF Dec.
C24	10000		22-3	BPD-01	DD-103	PTE4S1	811-01	36C1	Audio Coupling
C25	100		22-5	SI100	D6-101	5W5T1	GP1K-100	19C11	Diode RF Filter
C26	.004	600	22-448	P688-004	D6-402	PTE6D4	GP2M-004	6TM-D4	2nd IF Decoupling
C27	10000		22-3	BPD-01	DD-103	PTE4S1	811-01	36C1	2nd IF Cath.
C28	10000		22-3	BPD-01	DD-103	PTE4S1	811-01	36C1	2nd IF Fil.
C29	10000		22-3	BPD-01	DD-103	PTE4S1	811-01	36C1	Limiter Decoupling
C30	.001	200	22-1717	P688-001	D6-102	PTE6D1	GP2L-001	6TM-D1	De-emphasis
C31	10000		22-3	BPD-01	DD-103	PTE4S1	811-01	36C1	Vol. Cont. Isolation
C32	10000		22-3	BPD-01	DD-103	PTE4S1	811-01	36C1	Audio Coupling
C33	.0005	600	22-854	1468-0005	D6-501	5W5T5	GP2K-500	6TM-T5	AF Amp. Plate
C34	10000		22-3	BPD-01	DD-103	PTE6S1	811-01	36C1	Audio Coupling
C35	4000		22-4	BPD-004	DD-502	PTE6D4	GP2M-004	6TM-D4	Tone Compensation
C36	.05	600	22-829	P688-05	DF-503	PTE6S5		6TM-S5	Tone Compensation
C37	.01	600	22-669	P688-01	D6-103	PTE6S1	811-01	6TM-S1	Tone Compensation
C38	10000		22-3	BPD-01	DD-103	PTE4S1	811-01	36C1	RF Bypass
C39	.05	600	22-829	P688-05	DF-503	PTE6S5		6TM-S5	Phono Isolation
C40	.047	400	22-1775	P488-057	DF-503	PTE6S5		4TM-S47	Line Filter

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	63-2131	Q11-137	AG-61-S	AN-69	Volume control
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB	K-155	Attach to R1A per instructions
R2A	500KΩ	½	63-2132	Q11-133		SB-209	Tone control
B	Shaft		Not Req.	JQ, E190 •		Not Req.	Attach to R2A per instructions

• Cut JQ shaft to correct length so when shaft end E-190 is attached, the total length is correct.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	ZENITH PART No.	IRC PART No.	
R3	1 Meg.	½	63-1912	BTS-1 Meg.	AVC Network
R4	39Ω	½	63-1726		Parasitic Suppressor
R5	220Ω	½	63-1758	BTS-220	RF Amp. Plate Decoupling
R6	220Ω	½	63-1758	BTS-220	RF Amp. Screen
R7	68Ω	½	63-1737		RF Amp. Cathode
R8	10KΩ	½	63-1827	BTS-10K	Osc. Grid
R9	470Ω	½	63-1772		Parasitic Supp.
R10	220Ω	½	63-1758	BTS-220	Osc. Plate Decoupling
R11	6.8 Meg.	½	63-1947	BTS-6.8 Meg.	Conv. Grid
R12	6.8 Meg.	½	63-1947	BTS-6.8 Meg.	AVC Network
R13	2.2 Meg.	½	63-1926	BTS-2.2 Meg.	AVC Network
R14	220Ω	½	63-1758	BTS-220	Conv. Plate Decoupling
R15	470KΩ	½	63-1898	BTS-470K	AVC Network
R16	220KΩ	½	63-1884	BTS-220K	Voltage Divider
R17	220Ω	½	63-1758	BTS-220	1st IF Amp. Plate Decoupling
R18	47KΩ	½	63-1856	BTS-47K	Decoupling
R19	47KΩ	½	63-1856	BTS-47K	Decoupling
R20	100Ω	½	63-1744	BTS-100	2nd FM IF Amp. Cathode
R21	820Ω	½	63-2091		2nd FM IF Amp. Decoupling-Wire Wound
R22	100KΩ	½	63-1870	BTS-100K	Limiter Grid
R23	27KΩ	½	63-1845	BTS-27K	Limiter Decoupling
R24	47KΩ	½	63-1856	BTS-47K	Diode Filter
R25	1 Meg.	½	63-1912	BTS-1 Meg.	Diode Load
R26	150KΩ	½	63-1876	BTS-150K	Disc. Diode Load
R27	150KΩ	½	63-1876	BTS-150K	Disc. Diode Load
R28	100KΩ	½	63-1869	BTS-100K	De-emphasis
R29	4.7 Meg.	½	63-1940	BTS-4.7 Meg.	AF Amp. Grid
R30	470KΩ	½	63-1898	BTS-470K	AF Amp. Plate
R31	10KΩ	½	63-1828	BTS-10K	Tone Compensation
R32	470KΩ	½	63-1897	BTS-470K	Output Grid
R33	120Ω	1	63-1981	BTA-120	Output Cathode
R34	3300Ω	½	63-1806	BTS-3300	Tone Compensation
R35	820Ω	½	63-1782	BTS-820	Tone Compensation
R36	15KΩ	½	63-1834	BTS-15K	Tone Compensation
R37	220KΩ	½	63-1884	BTS-220K	Phono Osc. Grid
R38	390Ω	½	63-1768		Parasitic Supp.
R39	12 Meg.	½	63-1954	BTS-12 Meg.	Phono Isolation-See Note 1
R40A	1300Ω	10	63-2068		Filter-Wire Wound
B	75Ω	10			Filament Dropping-Wire Wound
R41	4700Ω	½	63-1814	BTS-4700	Filter
R42	68KΩ	½	63-1863	BTS-68K	Phono Osc. Plate
R43	47Ω	1	63-2093	BW-1-47	Filament Dropping-Wire Wound

Note 1. Some models use 10 Meg. resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ .030A	350VAC @ .107 ADC			95-1188			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	2300Ω	4Ω	235Ω	.7Ω	95-1189	A-3876 ①	A-3018	RO-2 ①	① Drill one new mounting hole.

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
	FIELD	V. C. IMP.	ZENITH PART No.	JENSEN PART No.	QUAM PART No.	
SP1	PM	4Ω	49-688	ST-120 ② MOD. P10-S	10A4A	② Replace output transformer to match 6-8Ω voice coil.
	CONE DIA.	V. C. DIA.				
SP2	9 3/8"	1"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	ZENITH PART No.	MEISSNER PART No.	
L1	FM Ant. Loading Coil	.1Ω		S-16408		
L2	FM RF	.1Ω	0Ω	S-15743		
L3	FM Osc.	0Ω	0Ω	S-15691		
L4	Loop Ant.	1.5Ω		S-16841		
L5	AM Ant. Loading Coil	3.4Ω		S-17328		
L6	AM RF Coil	3.1Ω	12Ω	S-16344		
L7	AM Osc.	1.6Ω	9Ω	S-16345		
L8	1st AM IF	5.5Ω	19Ω	95-1200		
L9	1st FM IF	.5Ω	.5Ω	95-1201		
L10	2nd AM IF	20Ω	20Ω	95-1102	16-6660 *	* Add capacitor from black lead to ground
L11	2nd FM IF	.4Ω	.4Ω	95-1150	16-3487	
L12	3rd FM IF	.2Ω		95-1152		
L13	Osc. Trans.	.3Ω	.3Ω	95-1153		
L14	Phono Osc.	2Ω		S-12603		

PHONO CARTRIDGE and NEEDLE

ITEM No.	REPLACEMENT DATA					REMARKS
	ZENITH PART No.	ASTATIC PART No.		SHURE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1	S-15780					

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					ZENITH PART No.		
M2	Bayonet	115	10 Watt	Clear	100-97		

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M3	Switch	85-489	Phono-AM-FM
M4	3 Gang Var. Cap.	22-2104	(21-488MMF, 40-222MMF, 12-164MMF)
	Cabinet	14-1268R	
	Knob	46-873	Tone
	Knob	46-876	Tuning
	Knob	46-899	Band
	Dial Glass	192-138	
	Knob Assembly	S-17167	Volume

PHOTOFACT* Folder

ZENITH MODELS
H2226R, H2227E, H2227R,
H2250R, H2255E (CH. 22H20)

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MODEL H2250R

ZENITH MODELS
H2226R, H2227E, H2227R,
H2250R, H2255E (CH. 22H20)

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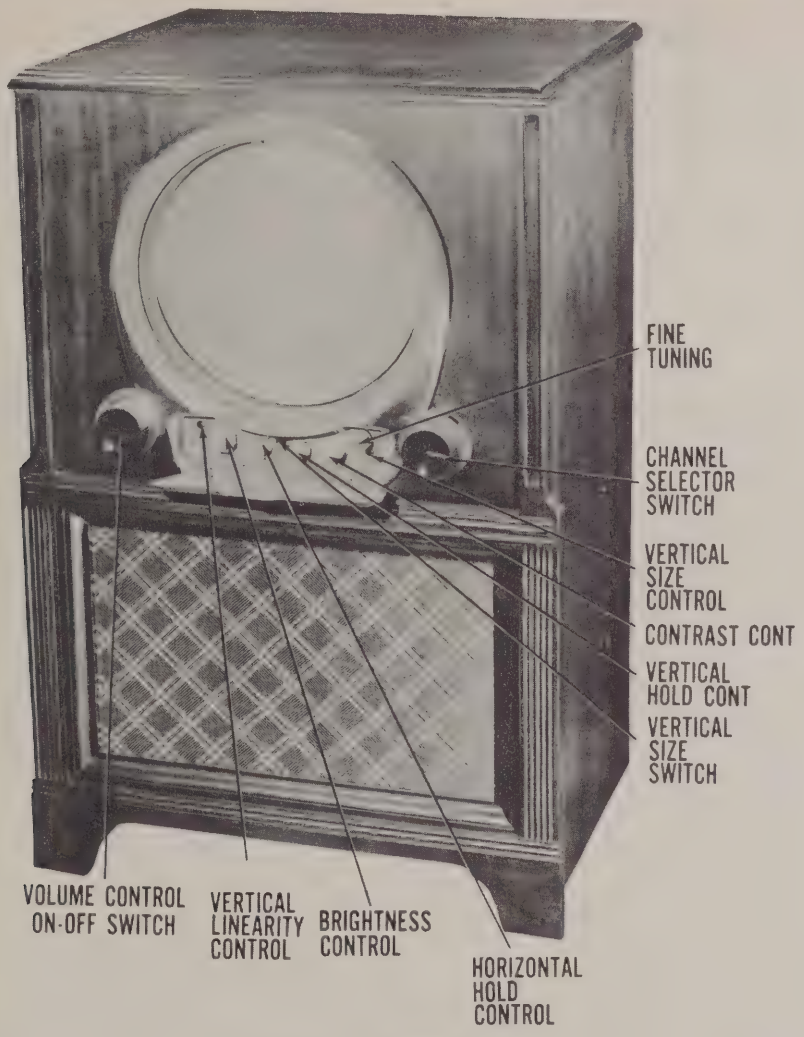

ZENITH MODEL H2250R

TRADE NAME	Zenith, Models H2226R, H2227E, H2227R, H2250R, H2255E (Ch. 22H20)
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago, Illinois
TYPE SET	Television Receiver
TUBES	Twenty Two
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATING	1.8 Amp. at 117 Volts AC
TUNING RANGE	Channels 2 thru 13

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ZENITH MODELS H2226R, H2227E, R, H2250R, H2255E (Ch. 22H20)

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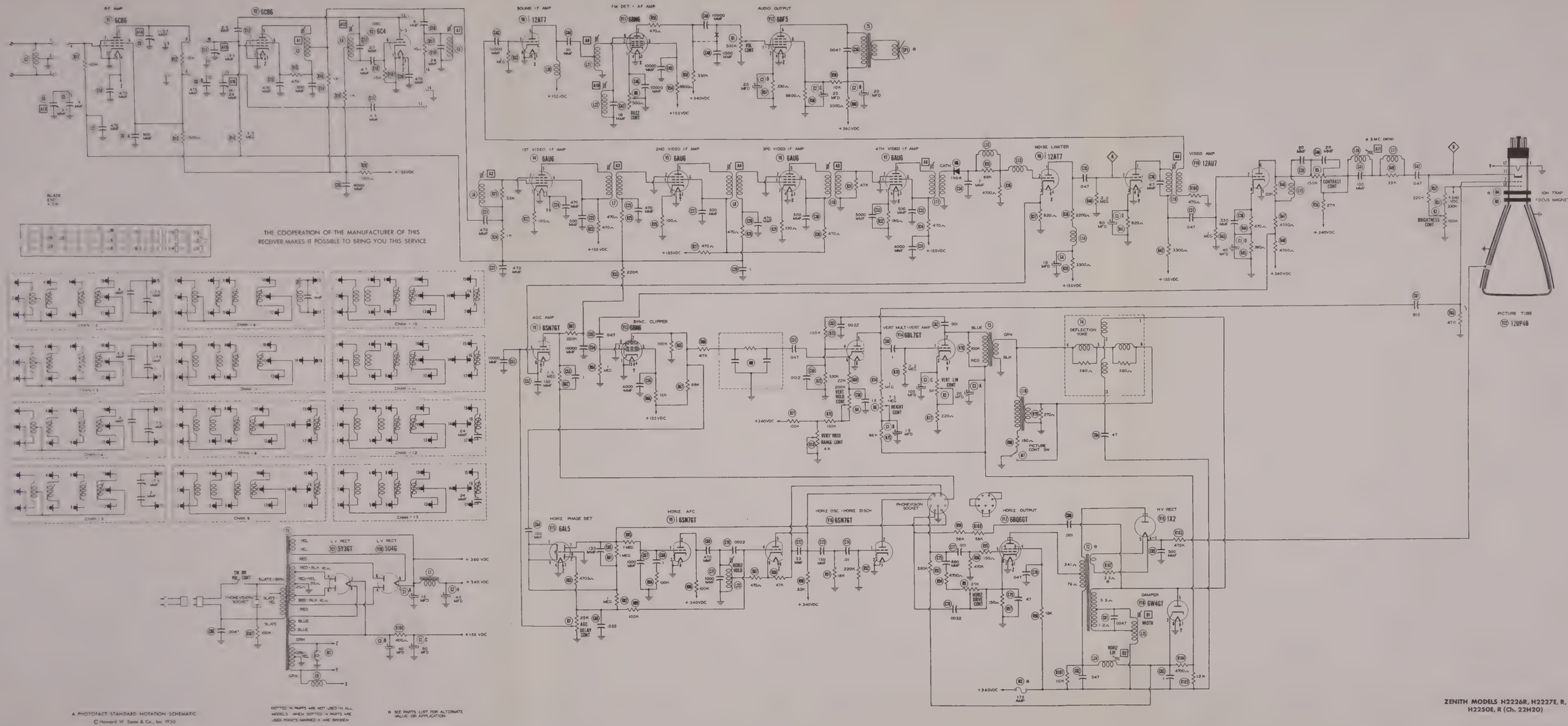

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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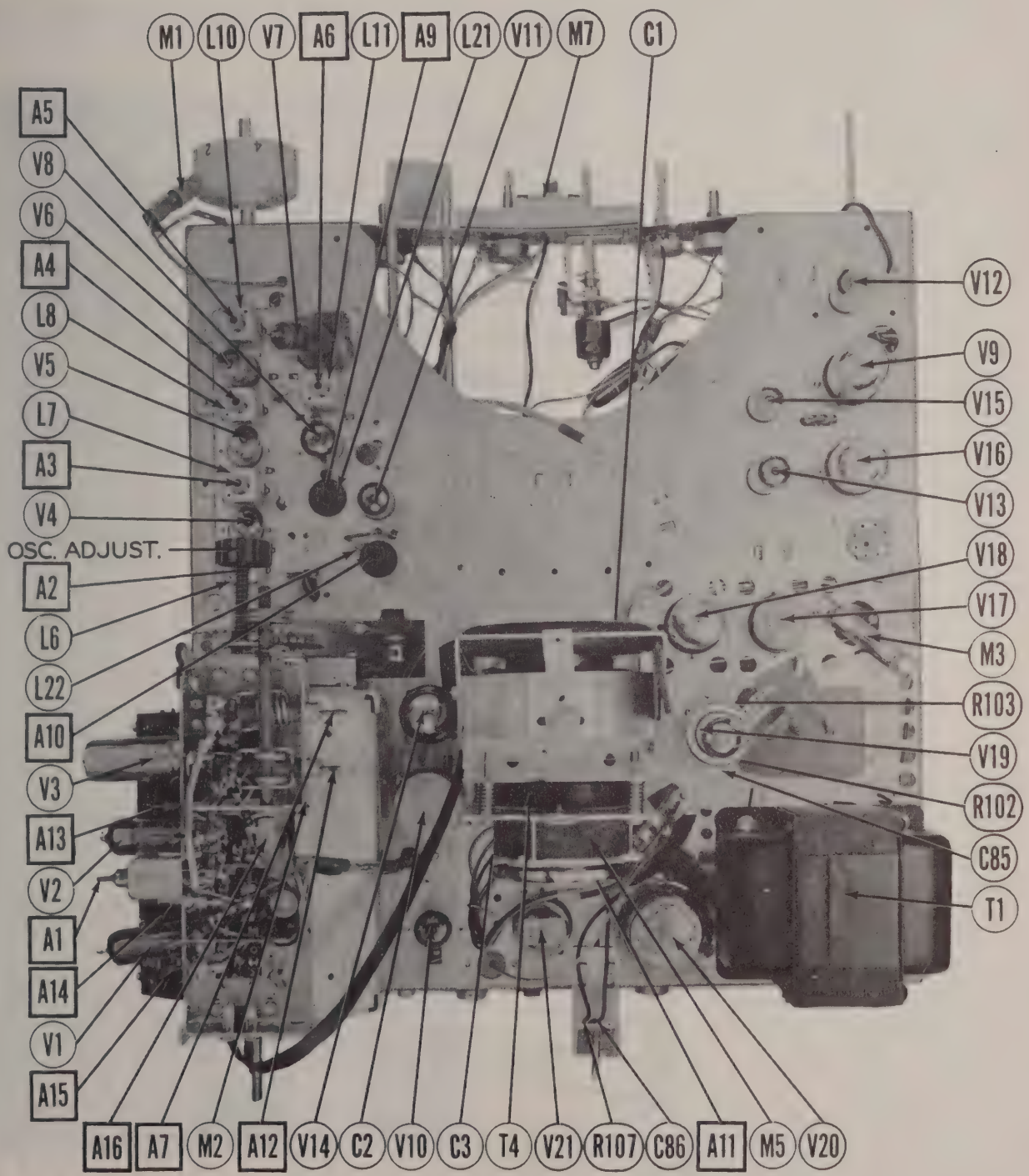
DOTTED 'H' PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED 'H' PARTS ARE USED POINTS MARKED X ARE BROKEN

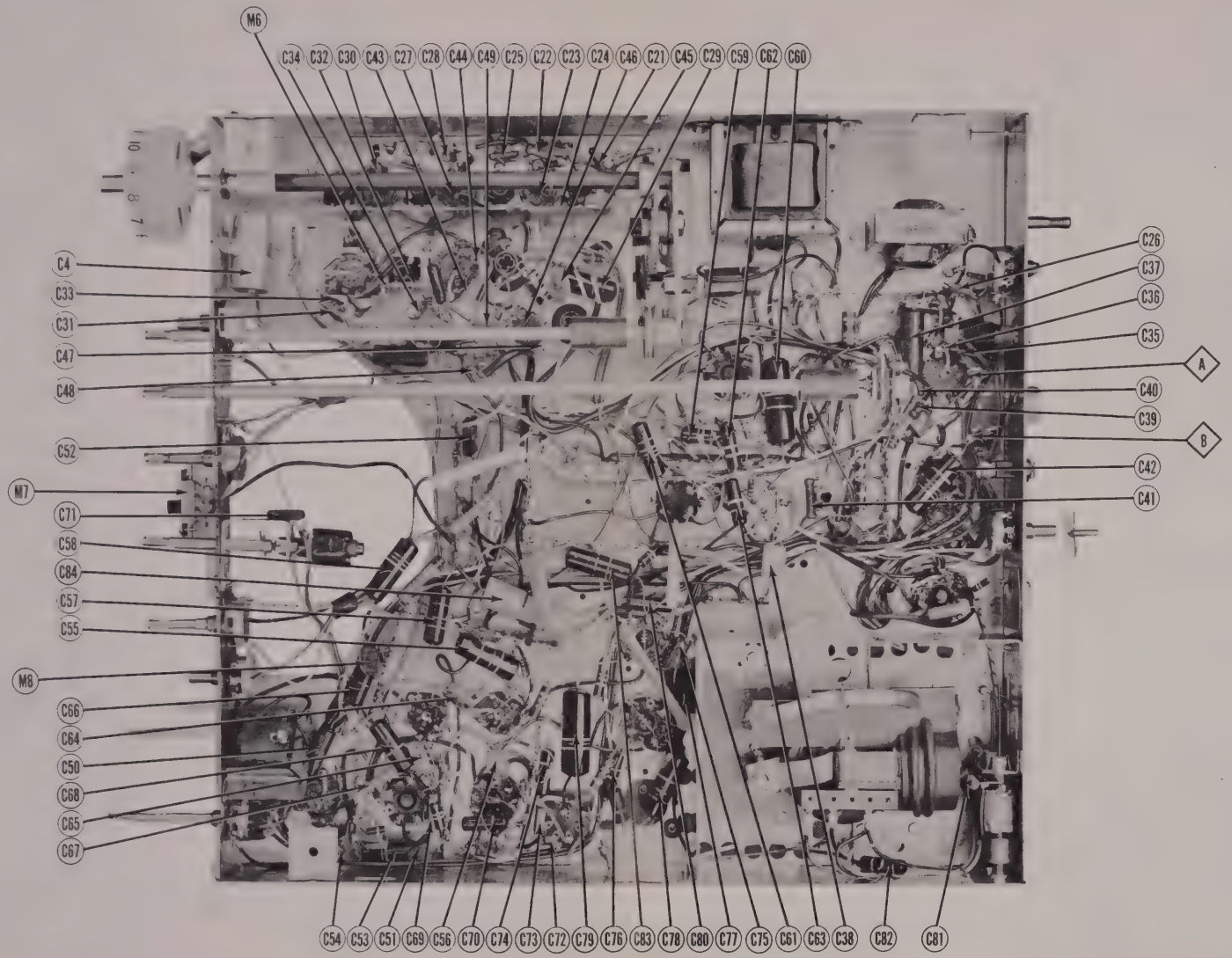
⊙ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

ZENITH MODELS H2226R, H2227E, R, H2250E, R (Ch. 22H20)

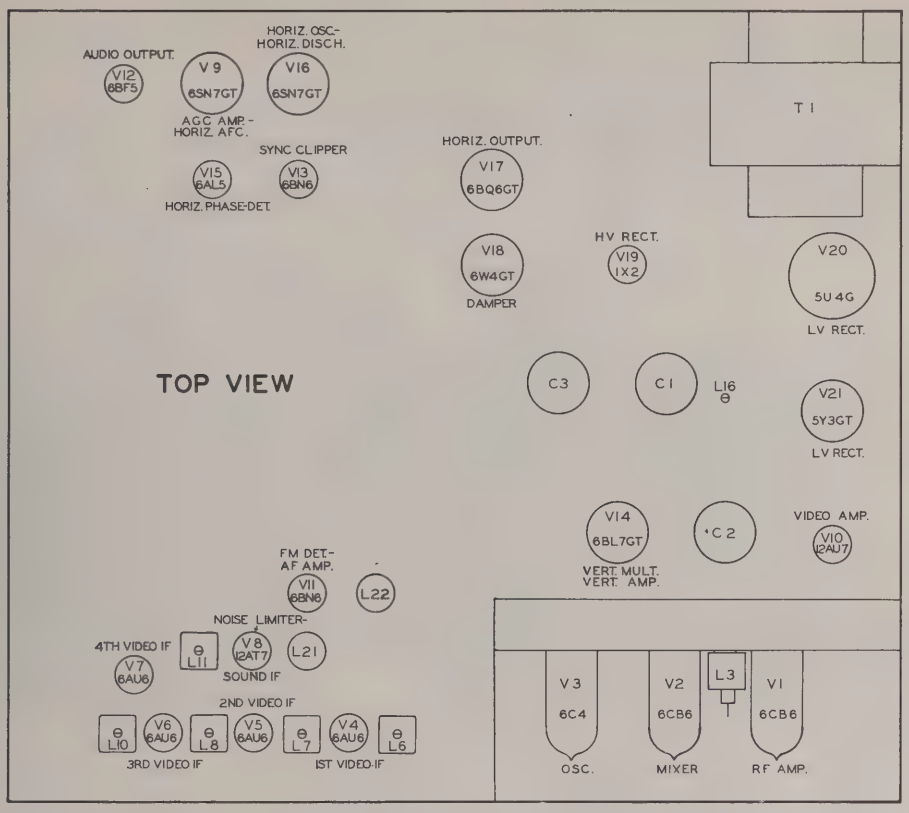
ZENITH MODELS H2226R, H2227E, R, H2250R, H2255E (Ch. 22H20)

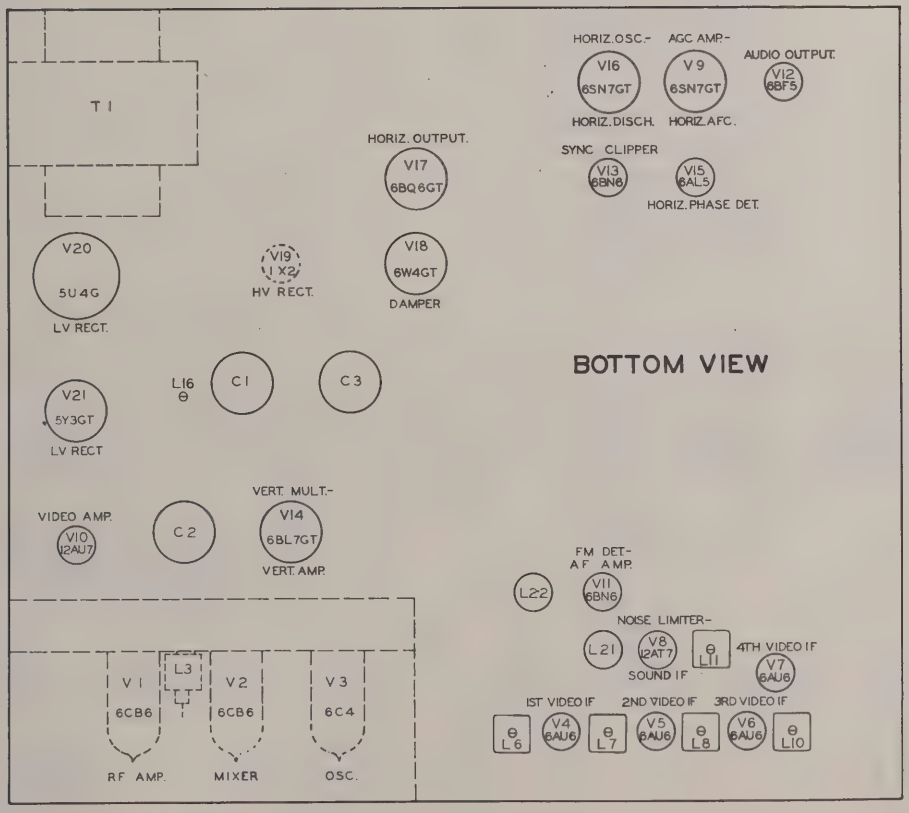


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

If the receiver is to be aligned with the picture tube removed, the high voltage lead should be securely taped and dressed away from the chassis.

VIDEO IF ALIGNMENT

Remove the local oscillator tube V3 from its socket to prevent erroneous indications.
Connect the negative terminal of a 4.5 volt battery to the junction of R11 and C7 and positive terminal to chassis.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	44MC (10MC SWP)	42.75MC 43.5MC 45MC 45.75MC	Any	Vert. Amp. thru 10KΩ to Point (A). Low side to chassis.	A1, A2, A3, A4, A5, A6	Adjust for overall response of maximum amplitude and linearity similar to figure 1. The adjustment of A1, A2, and A4 effect the low frequency portion of the curve, A3 and A5 effect the high frequency portion, and A6 effects the top and should be adjusted for best symmetry.
2.	Direct	"	"	47.25MC	2	"	A7	Adjust for minimum marker indication at the 47.75MC point on response curve.

SOUND IF ALIGNMENT

Proper alignment of the sound IF can be obtained only if the signal input is below the limiting level of the Gated beam detector tube. This level can be easily identified by a background "hiss" similar to superregeneration. The sound IF system is aligned using a TV station signal as follows:

(a) Connect a variable attenuator pad between antenna and the receiver and adjust it until the signal falls below the detector limiting level as outlined above. Adjust the sound take-off coil A8, the detector input coil A9, the quadrature coil A10 and the buzz control R8 for maximum sound and minimum buzz. It should be noted that any of these adjustments may cause the "hiss" to disappear and it will be necessary to reduce further the signal so that the "hiss" will never disappear during alignment.

4.5MC TRAP ADJUSTMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
3.	.005MFD	High side to pin 2 (Grid) of 12AU7 (V10). Low side to chassis.	4.5MC (Unmod.)	Any	DC Probe thru detector probe as shown in figure 2 to point (B). Common to chassis.	All	Adjust for MINIMUM deflection.

OSCILLATOR ALIGNMENT

Replace the local oscillator tube (V3) in its socket.
Connect a 4.5 volt battery as in Video IF Alignment.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Turn the fine tuning control until the open end of the RF shelf pully faces upward.
The overall oscillator circuit adjustment A12 should not be adjusted unless the oscillator can be adjusted to the proper frequency with the strip oscillator for each channel except channel 7. Channel 7 has no strip oscillator adjustment.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	177MC (10MC SWP)	175.25MC 179.75MC	7	Vert. Amp. thru 10KΩ to Point (A). Low side to chassis.	A12	Adjust to place sound marker as shown in figure 3. The video marker should be at 50%.
5.	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	"		Check to see that the sound marker can be properly placed with the strip oscillator adjustment.
			207MC (10MC SWP)	205.25MC 209.75MC	12			
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			85MC (10MC SWP)	83.25MC 87.75MC	6			
			79MC (10MC SWP)	77.25MC 81.75MC	5			
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			

RF ALIGNMENT

Connect a 4.5 volt battery as in Video IF Alignment.
If the response curve seems to be tilted approximately the same amount on all channels, check the Video IF Alignment before attempting RF Alignment.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	69MC (10MC SWP)	67.25MC 71.75MC	4	Vert. Amp. thru 10KΩ to Point (A). Low side to chassis.	A13, A14, A15	Adjust for maximum amplitude and symmetry as per figure 3.
7.	"	"	177MC (10MC SWP)	175.25MC 179.75MC	7	"	A16	Adjust for maximum amplitude with proper bandpass as per figure 3. The converter plate coil (A1) will have to be adjusted after the cover is removed and again retuned after the cover is replaced.

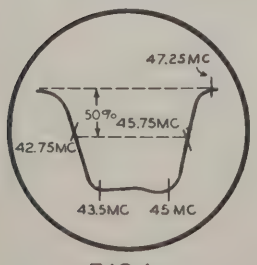


FIG.1

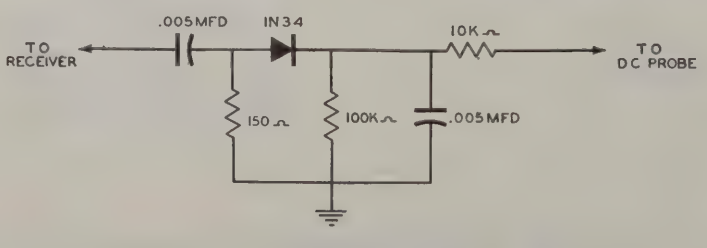


FIG.2

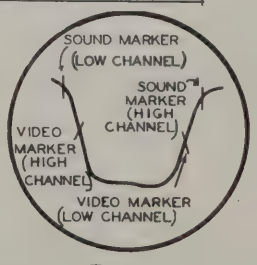
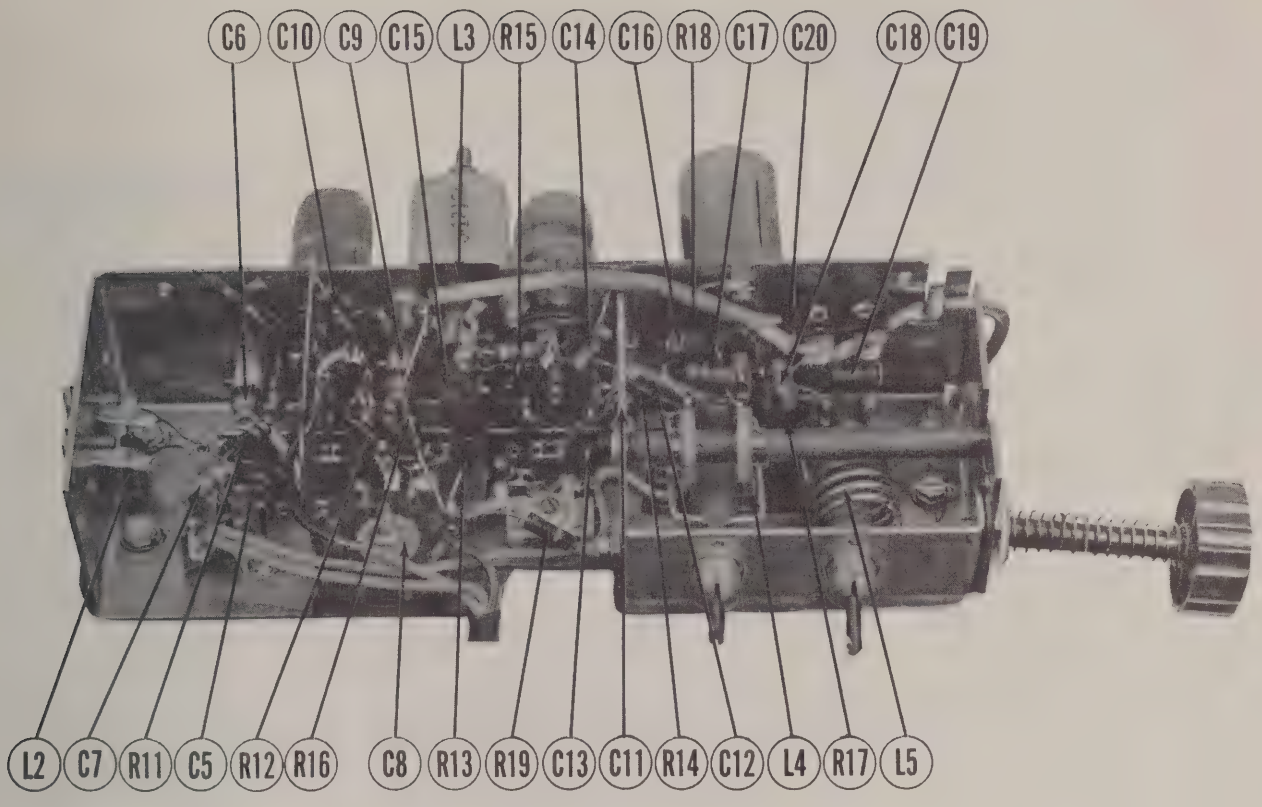


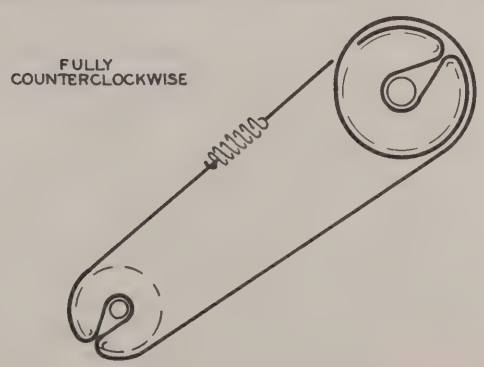
FIG.3



RF TUNER
DISASSEMBLY INSTRUCTIONS

1. Remove seven push-on type control knobs.
2. Remove five wood screws holding rear cover in place. Remove rear cover.
3. Disconnect built-in antenna .
4. Remove antenna terminal strip.
5. Disconnect speaker leads.
6. Disconnect ground lead.
7. Remove four 3/8" hex head bolts from chassis. Remove chassis.
8. Remove four 3/8" hex nut from speaker. Remove speaker.

FOR PICTURE TUBE REMOVAL FOLLOW INSTRUCTIONS ABOVE.



FINE TUNING DIAL CORD STRINGING

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	-2.4VDC	0V	0V	6.3VAC	150VDC	140VDC	0V		
V 2	6CB6	-4.4VDC	0V	6.3VAC	0V	150VDC	110VDC	0V		
V 3	6C4	130VDC	0V	6.3VAC	0V	130VDC	§-5.5VDC	0V		
V 4	6AU6	-.4VDC	0V	6.3VAC	0V	130VDC	150VDC	.4VDC		
V 5	6AU6	-.4VDC	0V	6.3VAC	0V	130VDC	150VDC	.4VDC		
V 6	6AU6	-.4VDC	0V	6.3VAC	0V	130VDC	150VDC	.4VDC		
V 7	6AU6	0V	0V	6.3VAC	0V	130VDC	145VDC	1.8VDC		
V 8	12AT7	150VDC	-1.6VDC	.4VDC	6.3VAC	6.3VAC	135VDC	-.8VDC	0V	0V
V 9	6SN7GT	-1VDC	130VDC	0V	-4.4VDC 0V	-1.2VDC	.4VDC	6.3VAC	0V	
V 10	12AU7	130VDC	0V	4.7VDC	0V	0V	245VDC	-.3VDC	10VDC	6.3VAC
V 11	6BN6	1VDC 5VDC	0V	6.3VAC	0V	90VDC	0V	105VDC		
V 12	6BF5	0V	9VDC	6.3VAC	0V	205VDC	90VDC	0V		
V 13	6BN6	0V	-.4VDC	0V	6.3VAC	75VDC	0V	70VDC		
V 14	6BL7GT	-.1VDC	400VDC	30VDC	-.8VDC	90VDC	15VDC	6.3VAC	0V	
V 15	6AL5	1.8VDC	-4.4VDC	6.3VAC	0V	1.8VDC	0V	-2VDC		
V 16	6SN7GT	-22VDC	60VDC	0V	-20VDC	250VDC	1.6VDC	0V	6.3VAC	
V 17	6BQ6GT	-1.9VDC	0V	0V	180VDC	-7.4VDC	-7.4VDC	6.3VAC	10VDC	TOP CAP *
V 18	6W4GT	-1.3VDC	340VDC	440VDC	9VDC	335VDC	75VDC	6.3VAC	0V	
V 19	1X2	* DO NOT MEASURE								
V 20	5U4G	0V	360VDC	0V	340VAC	7VDC	340VAC	340VDC	360VDC	
V 21	5Y3GT	6.3VAC	180VDC	6.3VAC	190VAC	0V	190VAC	0V	180VDC	
V 22	12UP4B	0V	0V	PIN 10 340VDC	PIN 11 75VDC	PIN 12 6.3VAC				

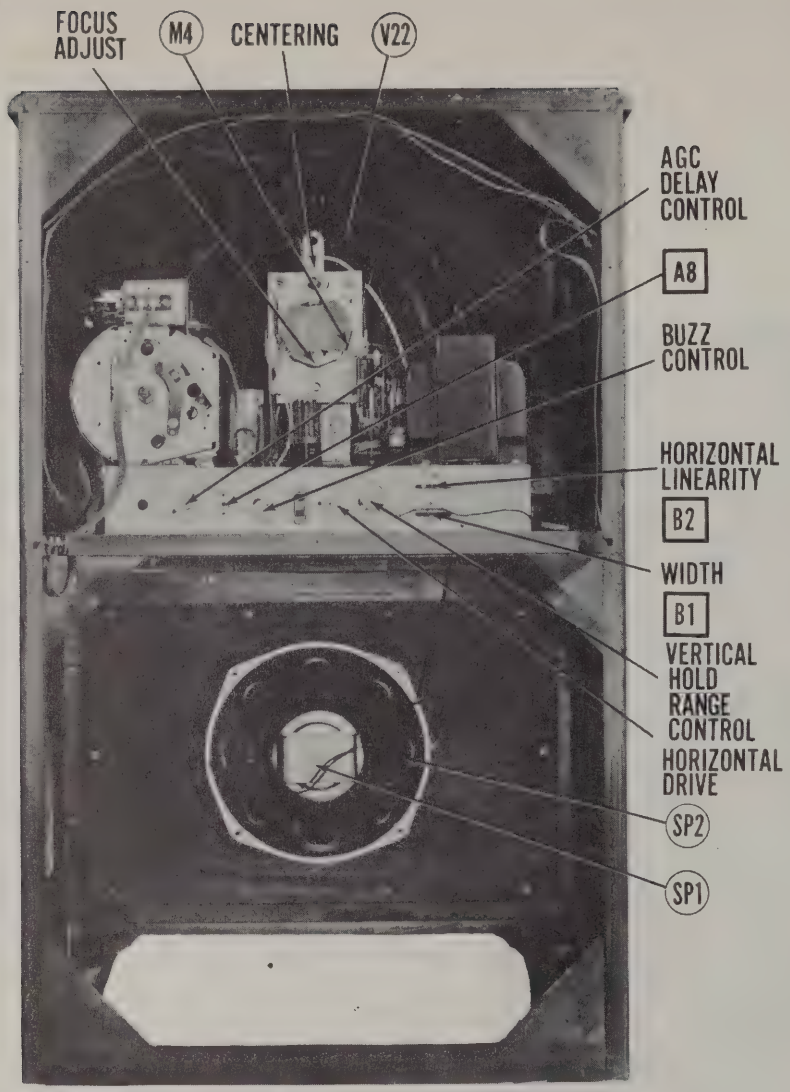
§ TAKEN WITH VACUUM TUBE VOLTMETER
* DO NOT MEASURE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	2 Meg.	0Ω	0Ω	.1Ω	#2KΩ	#2KΩ	0Ω		
V 2	6CB6	5.2 Meg.	0Ω	.1Ω	0Ω	#1.5KΩ	#48KΩ	0Ω		
V 3	6C4	#1.5KΩ	Inf.	.1Ω	0Ω	#1.5KΩ	15KΩ	0Ω		
V 4	6AU6	2 Meg.	0Ω	.1Ω	0Ω	#870Ω	#870Ω	100Ω		
V 5	6AU6	2 Meg.	0Ω	.1Ω	0Ω	#870Ω	#870Ω	100Ω		
V 6	6AU6	2 Meg.	0Ω	.2Ω	0Ω	#1.3KΩ	#1.3KΩ	100Ω		
V 7	6AU6	.1Ω	0Ω	.2Ω	0Ω	#870Ω	#870Ω	180Ω		
V 8	12AT7	#5.9KΩ	4.7KΩ	820Ω	.2Ω	.2Ω	#400Ω	1 Meg.	0Ω	0Ω
V 9	6SN7GT	3 Meg.	†100KΩ	0Ω	0Ω 25KΩ	1.5 Meg.	820Ω	.1Ω	0Ω	
V 10	12AU7	#3.7KΩ	2.2 Meg.	820Ω	0Ω	0Ω	†9.5KΩ	1 Meg.	860Ω	.1Ω
V 11	6BN6	500Ω 100Ω	6.2Ω	.2Ω	0Ω	#7.2KΩ	4.7Ω	†330KΩ		
V 12	6BF5	70Ω	330Ω	.1Ω	0Ω	†4.3KΩ	†7KΩ	70Ω		
V 13	6BN6	0Ω	1 Meg.	0Ω	.1Ω	#15KΩ	0Ω	#50KΩ		
V 14	6BL7GT	2.2 Meg.	†7KΩ	5.2KΩ	330KΩ	†8 Meg.	375KΩ	.1Ω	0Ω	
V 15	6AL5	1 Meg.	30KΩ	.1Ω	0Ω	1 Meg.	0Ω	2 Meg.		
V 16	6SN7GT	220KΩ	†570KΩ	0Ω	122KΩ	†33KΩ	470Ω	0Ω	.1Ω	
V 17	6BQ6GT	2 Meg.	0Ω	Inf.	†15KΩ	470KΩ	470KΩ	.1Ω	150Ω	TOP CAP †6KΩ
V 18	6W4GT	2 Meg.	†200Ω	†6KΩ	22KΩ	†200Ω	†570KΩ	.1Ω	0Ω	
V 19	1X2	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP †6.2KΩ
V 20	5U4G	Inf.	50KΩ	0Ω	30Ω	160KΩ	30Ω	50KΩ	50KΩ	
V 21	5Y3GT	.1Ω	60KΩ	.1Ω	20Ω	Inf.	20Ω	Inf.	60KΩ	
V 22	12UP4A	0Ω	47KΩ	PIN 10 †190Ω	PIN 11 320KΩ	PIN 12 .1Ω				

† MEASURED FROM PIN 2 OF V20
# MEASURED FROM PIN 2 OF V21

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



CABINET- REAR VIEW

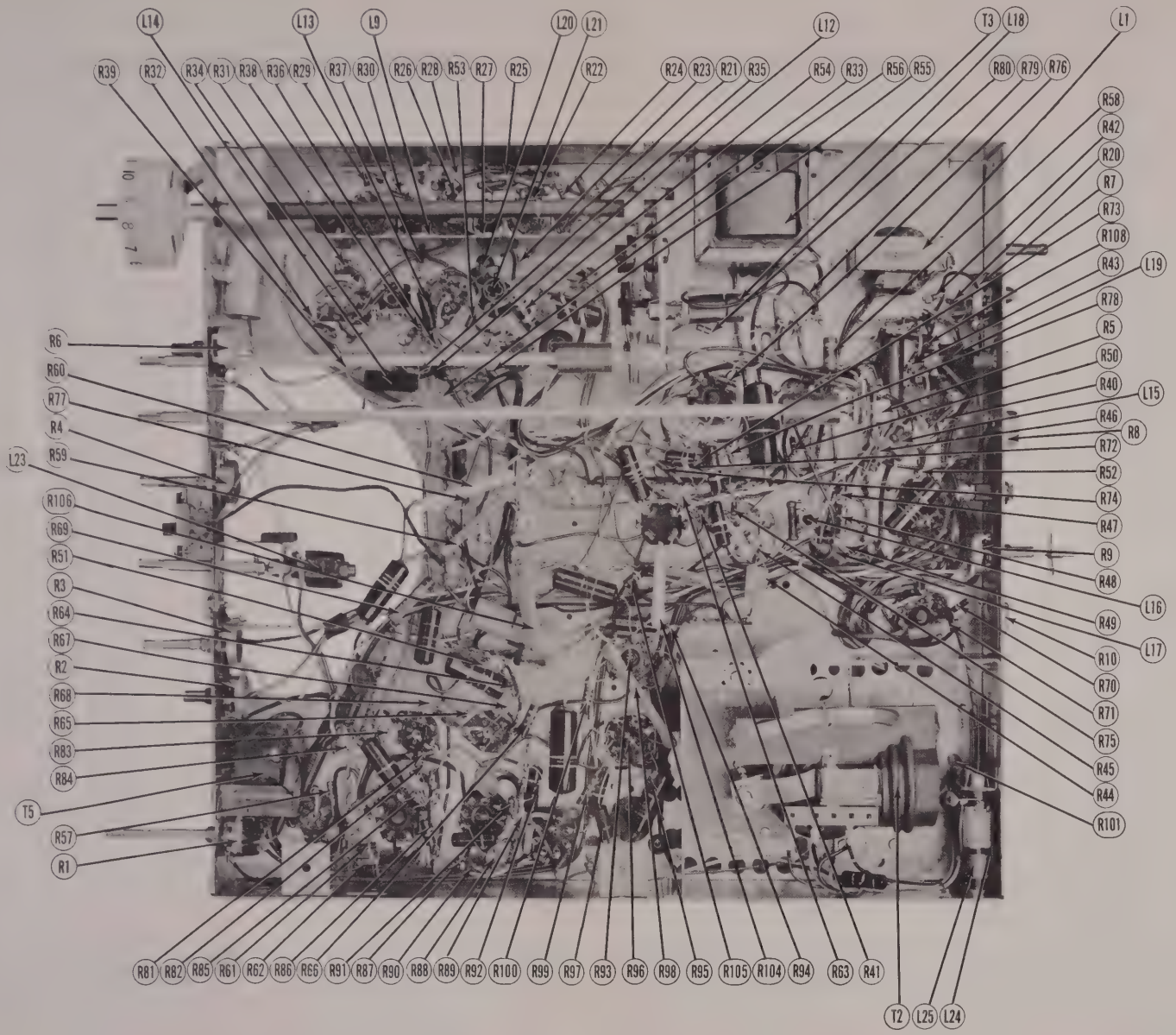
HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal hold until the picture synchronizes horizontally.

Turn the horizontal drive control clockwise as far as possible without crowding the right side of the picture.

Adjust the width slug (B1) until the picture fills the mask horizontally. Adjust the horizontal linearity slug (B2) until picture is symmetrical from left to right. A slight readjustment of the horizontal drive control may be necessary for optimum results.



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6CB6	6CB6	6CK	
V2	Mixer	6CB6	6CB6	6CK	
V3	Oscillator	6C4	6C4	6BG	
V4	1st Video IF	6AU6	6AU6	7BK	
V5	2nd Video IF	6AU6	6AU6	7BK	
V6	3rd Video IF	6AU6	6AU6	7BK	
V7	4th Video IF	6AU6	6AU6	7BK	
V8	Noise Limiter-Sound IF Amp.	12AT7	12AT7	9A	
V9	AGC Amp.-Hor. AFC	6SN7GT	6SN7GT	8BD	
V10	Video Amp.	12AU7	12AU7	9A	
V11	FM Det.-AF Amp.	6BN6	6BN6	7DF	
V12	Audio Output	6BF5	6BF5	7BT	
V13	Sync. Clipper	6BN6	6BN6	7DF	
V14	Vert. Mult.-Vert. Amp.	6BL7GT	6BL7GT		
V15	Hor. Phase Det.	6AL5	6AL5	6BT	
V16	Hor. Osc.-Hor. Disch.	6SN7GT	6SN7GT	8BD	
V17	Hor. Output	6BQ6GT	6BQ6GT	5BT	
V18	Damper	6W4GT	6W4GT	4CG	
V19	HV Rect.	1X2	1X2	7CB	
V20	LV Rect.	5U4G	5U4G	5T	
V21	LV Rect.	5Y3GT	5Y3GT	5T	
V22	Picture Tube	12UP4B	12UP4B	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	15	475	22-2122	AF33X16G8B		UPT417		TVL-4815	▲ Filter
B	15	475							■ Vert. MV Dec.
C	80	300							▲ Filter
D	40	50							V. Amp. Cath.
C2A	40	450	22-2224	AFH84J4E4A		UPT42245			▲ Filter
B	20	450				C			■ Filter
C	20	200							▲ Filter
D	20	25							Output Cathode
C3A	20	475	22-2223	AF4X8G20B		UPT422			▲ Vert. Output Dec.
B	40	300		16A					■ Filter
C	100	50							▲ Vert. Output Cath.
D	80	25							V. Amp. Cath.
C4	10	250	22-2154	PRS250/12		BR1025		TVA-1504	Noise Limiter Dec.
C5	5		22-2050	SI5NPO	TCZ-4.7		NPOK-5		Fixed Padder
C6	1-3.5		22-2093		829-4				Variable Padder
C7	470		22-2219	SI470	D6-471		GP2K-470	19C15	AGC Filter
C8A	600		22-82						RF Decoupling
B	475		22-69						RF Bypass
C9	1-3.5		22-2093		829-4				Variable Trimmer
C10	470		22-2219	SI470	D6-471		GP2K-470	19C15	RF Fil. Bypass
C11	1-3.5		22-2093		829-4				Variable Trimmer
C12	2.5		22-1891						Osc. Coupling
C13	4.5		22-2207						Osc. Coupling
C14	500		22-2216	SI500	D6-501		GP2K-500	19C32	Mixer Screen Dec.
C15	470		22-2219	SI470	D6-471		GP2K-470	19C15	Mixer Screen Byp.
C16	47		22-1876	SI47	D6-470		GP1K-47	19C25	Osc. Grid Cap.
C17	20		22-2204				N080-331-20		Fixed Trimmer
C18	6		22-2051				NPOK-6		RF Coupling
C19	28		22-2155				N080-331-28		Fixed Trimmer
C20	470		22-2219	SI470	D6-471		GP2K-470	19C15	Osc. Fil. Bypass
C21	470		22-2217	SI470	D6-471	5W5T5	GP2K-470	19C15	IF Coupling
C22	470		22-2143	SI470	D6-471	5W5T5	GP2K-470	19C15	AGC Filter
C23	500		22-2216	SI500	D6-501	5W5T5	GP2K-500	19C32	1st V. IF Decoup.
C24	470		22-2143	SI470	D6-471	5W5T5	GP2K-470	19C15	1st V. IF Fil.
C25	470		22-2143	SI470	D6-471	5W5T5	GP2K-470	19C15	AGC Filter
C26	4000		22-4	BPD-004	DD-502	1D5D4	811-005	29C1	RF Bypass
C27	500		22-2216	SI500	D6-501	5W5T5	GP2K-500	19C32	2nd V. IF Decoup.
C28	470		22-2143	SI470	D6-471	5W5T5	GP2K-470	19C15	AGC Filter
C29	.1	200	22-1777	P288-1	DF-104	PTE4P1		2TM-P1	AGC Filter
C30	500		22-2216	SI500	D6-501	5W5T5	GP2K-500	19C32	3rd V. IF Decoup.
C31	4000		22-4	BPD-004	DD-502	1D5D4	811-005	29C1	RF Bypass
C32	500		22-2216	SI500	D6-501	5W5T5	GP2K-500	19C32	4th V. IF Dec.
C33	5000		22-4	BPD-005	DD-502	1D5D5	811-005	29C1	4th V. IF Cath.
C34	7		22-1874	SI6.8NPO	TCZ-6.8	5W5Q1	NPOK-6.8	19C3	V. Diode Filter
C35	.047	600	22-1844	P688-047	DF-503	PTE6S5		6TM-S47	Video Coupling
C36	47		22-1876	SI50NPO	TCZ-47	5R5Q5	NPOM-50	29C14	Fixed Trimmer
C37	.047	600	22-1844	P688-047	DF-503	PTE6S5		6TM-S47	Video Coupling
C38	330	500	22-1645	1468-00035	D6-331	5W5T3	GP2K-330	1FM-335	V. Amp. Cathode
C39	20		22-2233	SI20	TCZ-20	5W5Q2	GP1K-20	MS-42	Peaking
C40	20		22-2233	SI20	TCZ-20	5W5Q2	GP1K-20	MS-42	Peaking
C41	100		22-2234	SI100NPO	TCZ-100	5R5T1	NPOM-100	36C10	Fixed Trimmer
C42	.047	600	22-1844	P688-047	DF-503	PTE6S5		6TM-S5	Video Coupling
C43	10000		22-3	BPD-01	DD-103	PTE4S1	811-01	36C1	S. IF Coupling
C44	50		22-1761	SI50	D6-500	5W5Q5	GP1K-50	19C28	S. IF Coupling
C45	10000		22-3	BPD-01	DD-103	PTE6S1	811-01	36C1	FM Det. Screen
C46	10000		22-3	BPD-01	DD-103	PTE6S1	811-01	36C1	FM Det. Cath.
C47	10		22-2106				N150K-10		Fixed Trimmer
C48	1000		22-2218	SI1000	D6-102	1W5D1	GP2L-001	29C21	De-emphasis
C49	10000		22-3	BPD-01	DD-103	PTE4S1	811-01	36C1	Audio Coupling
C50	.0047	600	22-1782	P688-0047	D6-472	PTE6D5	GP2M-0047	6TM-D47	Output Plate Bypass
C51	10000		22-3	BPD-01	DD-103	PTE6S1	811-01	36C1	AGC Amp. Grid
C52	150	500	22-1137	1468-00015	D6-151	5W5T15	GP1K-150	1FM-315	Cathode Bypass
C53	.1	200	22-1810	P288-1	DF-104	PTE4P1		2TM-P1	Hor. Sweep Coupling
C54	10000		22-3	BPD-01	DD-103	PTE6S1	811-01	36C1	AGC Filter
C55	.047	600	22-1844	P688-047	DF-503	PTE6S5		6TM-S47	Sync. Coupling
C56	4000		22-4	BPD-004	DD-402	1D5D4	811-005	29C1	Sync. Clipper Screen
C57	.047	400	22-1775	P4888-047	DF-503	PTE4S5		4TM-S47	Vert. Sync. Coupling
C58	.15	200	22-2166	P288-15		GT2P2		2TM-P15	Vert. MV Cath.

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C59	.0012	600	22-1880	P688-0015	D6-122	PTE6D1	GP2L-0012	6TM-D15	Vert. MV Grid
C60	.1	600	22-1841	P688-1	DF-104	PTE6P1		6TM-P1	Vert. Sweep Coupling
C61	.015	600	22-2264	P688-015		PTE6S15		6TM-S15	Vert. Sweep Coupling
C62	.001	600	22-2128	P688-001	D6-102	PTE6D1	GP2L-001	6TM-D1	Vert. Feedback
C63	.0022	600	22-1814	P688-0022	D6-222	PTE6D2	GP2M-0022	6TM-D22	Voltage Divider
C64	100	500	22-385	1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	Hor. Sync. Coupling
C65	130	500	22-2162		TCZ-130		NPO-334-130		AFC Filter
C66	.022	200	22-2071	1468-022	DF-203	PTE4S2		4TM-S22	AFC Filter
C67	1000		22-2112	SI1000	D6-102	1W5D1	GP2L-001	29C21	AFC Filter
C68	.1	200	22-1777	P288-1	DF-104	PTE4P1		2TM-P1	AFC Filter
C69	470	500	22-1138	1468-0005	D6-471	5W5T5	GP2K-470	1FM-35	AFC Coupling
C70	.0022	600	22-1845	P688-0022	D6-222	PTE6D2	GP2M-0022	6TM-D22	Hor. Osc. Grid Cap.
C71	1000	500	22-2163	1464-001		1R5D1		MS-21	Fixed Trimmer
C72	33		22-2168	SI33	D6-330	5W5Q3	GP1K-33	19C24	Hor. Sweep Coupling
C73	150	500	22-470	1468-00015	D6-151	5W5T15	GP2K-150	1FM-315	Differentiator Net.
C74	.01	400	22-1846	P488-01	D6-103	PTE4S1	811-01	4TM-S1	Hor. Sweep Coupling
C75	680	500	22-2034	SI680	D6-681	1W5T7	GP2K-680	MS-37	Hor. Discharge
C76	.0022	600	22-1814	P688-0022	D6-222	PTE6D2	GP2M-0022	6TM-D22	Voltage Divider
C77	.001	1000	22-1851	P1088-001		PTE16D1		MB-D1	Hor. Sweep Coupling
C78	.047	600	22-1834	P688-047	DF-503	PTE6S5		6TM-S47	Hor. Output Screen
C79	.47	200	22-2146	P288-47		GT2P5		2TM-P47	Hor. Output Cath.
C80	.001	600	22-2128	P688-001	D6-102	PTE6D1	GP2L-001	6TM-D1	Hor. Feedback
C81	.0047	600	22-1782	P688-0047	D6-472	PTE6D5	GP2M-0047	6TM-D47	Fixed Trimmer
C82	.047	400	22-1775	P488-047		PTE4S5		4TM-S47	Damper Filter
C83	.1	400	22-2061	P488-1		PTE4P1		4TM-P1	Damper Filter
C84	.47	200	22-2098	P288-47		GT2P5		2TM-P47	Hor. Sweep Coupling
C85	500	20000	22-2130	HV20C	TV3-502				HV Filter
C86	.0047	600	22-1782	P688-0047	D6-472	PTE6D5	GP2M-0047	6TM-D47	Line Filter

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	REPLACEMENT DATA: CENTRALAB PART No.	INSTALLATION NOTES
R1A	500KΩ	½	63-2125	Q13-133	AG-60-Z	BSK-60-S	Volume control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R1A per instructions
R2A	5000Ω	½	63-1674	Q11-114	AG-19-S	AN-10	Vert. linearity control
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Attach to R2A per instructions
R3A	100KΩ	½	63-2126	Q11-128	AG-49-S	SB-220	Brightness control
B	Shaft		Not Req.	Not Req.	KSS-3		Attach to R3A per instructions
R4A	200KΩ	½	63-2127		AG-52-S	SB-221	Vert. hold control
B	Shaft		Not Req.		KSS-3		Attach to R4A per instructions
R5	150KΩ	½	63-2133			SBT-217	Contrast control-tapped at 100KΩ and 125KΩ
R6	7.5 Meg.	½	63-2110			SB-219	Vert. size control
R7A	25KΩ	½	63-2153	Q11-120	AG-40-S	AN-26	AGC Delay control
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Attach to R7A per instructions
R8	500Ω	1	63-2050				Buzz control-min. resistance of 100Ω
R9A	25KΩ	½	63-1675	Q11-120	AG-40-S	AN-26	Horiz. drive control
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Attach to R9A per instructions
R10	4000Ω	1	63-1690				Vert. hold range control-min. resistance on 350Ω

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R11	100KΩ	½	63-1869		RF Amp. Grid
R12	10KΩ	½	63-1827		RF Amp. Plate
R13	1500Ω	1	63-1967	BTA-1500	RF Amp. Decoupling
R14	3.3 Meg. 20%	½	63-1933		Mixer Grid
R15	47KΩ	½	63-1855		Mixer Screen
R16	1000Ω	½	63-1785	BTS-1000	Mixer Decoupling
R17	10Ω 20%	½	63-1702		Parasitic Suppressor
R18	15KΩ	½	63-1835		Osc. Grid
R19	1000Ω	½	63-1785	BTS-1000	Osc. Plate Decoupling
R20	100Ω 20%	½	63-1744	BTS-100	Decoupling
R21	33KΩ	½	63-1849		1st Video IF Transformer Shunt
R22	100Ω	½	63-1743	BTS-100	1st Video IF Amp. Cathode
R23	470Ω 20%	½	63-1772	BTS-470	1st Video IF Amp. Decoupling
R24	1000Ω	½	63-1785	BTS-1000	AGC Network
R25	470Ω 20%	½	63-1772	BTS-470	AGC Network
R26	100Ω	½	63-1743	BTS-100	2nd Video IF Amp. Cathode
R27	470Ω 20%	½	63-1772	BTS-470	2nd Video IF Amp. Decoupling
R28	470Ω 20%	½	63-1772	BTS-470	AGC Network
R29	100Ω	½	63-1743	BTS-100	3rd Video IF Amp. Cathode
R30	470Ω 20%	½	63-1772	BTS-470	3rd Video IF Amp. Decoupling
R31	47KΩ	½	63-1855		4th Video IF Transformer Shunt
R32	180Ω	½	63-1754	BTS-180	4th Video IF Amp. Cathode
R33	220KΩ 20%	½	63-1884		AGC Network
R34	470Ω 20%	½	63-1772	BTS-470	4th Video IF Amp. Decoupling
R35	68KΩ	½	63-1862	BTS-68K	Video Peaking Coil Shunt
R36	4700Ω	½	63-1813	BTS-4700	Noise Limiter Grid
R37	820Ω	½	63-1782	BTS-820	Noise Limiter Cathode
R38	2200Ω	½	63-1799	BTS-2200	Noise Limiter Plate
R39	3300Ω	½	63-1806	BTS-3300	Noise Limiter Plate Decoupling
R40	2.2 Meg. 20%	½	63-1926	BTS-2.2 Meg.	Video Amp. Grid
R41	820Ω	½	63-1782	BTS-820	Video Amp. Cathode
R42	3300Ω	½	63-1806	BTS-3300	Video Amp. Plate
R43	1 Meg.	½	63-1912	BTS-1 Meg.	Video Amp. Grid
R44	470Ω	½	63-1771	BTS-470	Video Amp. Cathode
R45	390Ω	½	63-1788	BTS-390	Video Amp. Cathode
R46	22KΩ	2	63-1841	BTB-22K	Video Peaking Coil Shunt
R47	4700Ω	1	63-943	BTA-4700	Video Amp. Plate
R48	4700Ω	1	63-943	BTA-4700	Video Amp. Plate
R49	33KΩ	½	63-1848	BTS-33K	Video Peaking Coil Shunt
R50	27KΩ	½	63-1845	BTS-27K	Voltage Divider
R51	330KΩ	½	63-1890	BTS-330K	Voltage Divider
R52	220KΩ	½	63-1883	BTS-220K	Voltage Divider
R53	1 Meg. 20%	½	63-1912		Sound IF Amp. Grid
R54	6800Ω	2	63-1571	BTB-6800	FM Det. Screen

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R55	470Ω	½	63-1771	BTS-470	Isolation
R56	330KΩ 20%	½	63-1890	BTS-330K	AF Amp. Plate
R57	330Ω	½	63-1764	BTS-330	Audio Output Cathode
R58	6800Ω	2	63-1571	BTB-6800	Filter
R59	10KΩ	5	63-2022	1 3/4A-10K	Filter-Wire Wound
R60	3500Ω	10	63-2023	1 3/4A-3500	Filter-Wire Wound
R61	220KΩ 20%	½	63-1884	BTS-220K	AGC Network
R62	1.5 Meg.	½	63-1919	BTS-1.5 Meg.	AGC Network
R63	47KΩ	½	63-1855	BTS-47K	Picture Tube Grid
R64	1 Meg.	½	63-1911	BTS-1 Meg.	Sync. Clipper Grid
R65	100KΩ	½	63-1869	BTS-100K	Voltage Divider
R66	15KΩ	½	63-1065	BTA-15K	Sync. Clipper Screen
R67	68KΩ	½	63-1862	BTS-68K	Sync. Clipper Plate
R68	47KΩ	½	63-1855	BTS-47K	Integrator
R69	22KΩ	1	63-1841	BTA-22K	Vert. Mult. Cathode
R70	150KΩ	½	63-1876	BTB-150K	Voltage Divider
R71	100KΩ	½	63-1982	BTB-100K	Voltage Divider
R72	330KΩ	½	63-1890	BTS-330K	Vert. Mult. Grid
R73	100KΩ	½	63-1869	BTS-100K	Voltage Divider
R74	1 Meg. 20%	½	63-1912	BTS-1 Meg.	Vert. Mult. Plate
R75	68KΩ 20%	½	63-1863	BTS-68K	Vert. Mult. Decoupling
R76	2.2 Meg. 20%	½	63-1926	BTS-2.2 Meg.	Vert. Amp. Grid
R77	220Ω 20%	½	63-1758	BTS-220	Vert. Amp. Cathode
R78	100KΩ	½	63-1869	BTS-100K	Vert. Output Transformer Shunt
R79	270Ω	½	63-1761	BTS-270	Picture Control Transformer Shunt
R80	180Ω	½	63-1754	BTS-180	Picture Control Network
R81	1 Meg.	½	63-1911	BTS-1 Meg.	Horiz. Phase Det. Load
R82	1 Meg.	½	63-1911	BTS-1 Meg.	Horiz. Phase Det. Load
R83	4700Ω	½	63-1813	BTS-4700	Horiz. Phase Det. Load
R84	100KΩ 20%	½	63-1870	BTS-100K	Horiz. AFC Filter Network
R85	1 Meg.	½	63-1911	BTS-1 Meg.	Horiz. AFC Filter Network
R86	100KΩ	1	63-2137	BTA-100K	Horiz. AFC Plate
R87	470Ω	½	63-1771	BTS-470	Horiz. Osc. Cathode
R88	47KΩ	½	63-1855	BTS-47K	Voltage Divider
R89	100KΩ	½	63-1869	BTS-100K	Feedback
R90	33KΩ	1	63-957	BTA-33K	Horiz. Osc. Plate
R91	18KΩ	½	63-1838	BTS-18K	Differentiator
R92	220KΩ 20%	½	63-1884	BTS-220K	Horiz. Disch. Grid
R93	560KΩ	½	63-1901	BTS-560K	Horiz. Disch. Plate
R94	4700Ω	½	63-1813	BTS-4700	Horiz. Peaking
R95	150Ω 20%	½	63-1751		Parasitic Suppressor
R96	470KΩ 20%	½	63-1898	BTS-470K	Horiz. Output Grid
R97	150Ω 20%	2	63-1578	BW-2-150	Horiz. Output Cathode
R98	15KΩ	10	63-2128	1 3/4A-15K	Horiz. Output Screen-Wire Wound
R99	56KΩ	1	63-1160	BTA-56K	Feedback Network
R100	56KΩ	1	63-1160	BTA-56K	Feedback Network
R101	10KΩ 20%	2	63-2145	BTB-10K	Decoupling
R102	3.3Ω 20%	½	63-2129		HV Rect. Filament-Wire Wound-See Note 1
R103	470KΩ 20%	½	63-1898		HV Filter
R104	4700Ω	4	63-2150		Damper Filter-Wire Wound
R105	12KΩ	1	63-1975	BTA-12K	Damper Filter
R106	400Ω	5	63-2077	1 3/4A-400	Filter-Wire Wound
R107	100KΩ 20%	½	63-1870	BTS-100K	Line Filter
R108	470Ω	½	63-1771	BTS-470	Isolation

Note 1. Some models use a 1.2Ω resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC ② 1.8A	700VCT .150ADC Tap ③ 400VCT .025ADC	5VAC ② 3A	5VAC ② 2A SEC. 4 12.6VCT ③ 5.4A	95-1242			

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	NOTES
T2	420Ω Tap ③ 79Ω	6.7Ω Tap ④ 1.2Ω SEC. 2 0Ω	S-17265 ①		HVO-6		Hor. Output Trans.
T3	610Ω	13Ω	95-1239	A-8112 ②	A-3038	TSO-5	Vert. Output Trans.
T4A	16Ω		95-1241	DY-7	MD-3		Hor. Deflection Coil ②
B	62Ω						Vert. Deflection Coil

① Alternate Part #S-17130
② Drill one new mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
T5	9000Ω	4.3Ω	700Ω	.7Ω	95-1238	A-3879 ②	A-3020	RO-16 ②	② Drill one new mounting hole.

PARTS LIST CONTINUED ON PAGE 15

ZENITH MODELS H2226R, H2227E, R, H2250R, H2255E(Ch. 22H20)

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	ZENITH PART No.	JENSEN PART No.	QUAM PART No.	
SP1A	PM	4.3Ω	49-649 ③	ST-120 ⑤ MOD. P10-S	10A4A	③ Used in models H2250R, H2255E ④ Used in models H2226R, H2227R, H2227E ⑤ Replace output transformer to match 6-8Ω voice coil.
B	PM		49-679 ④			
	CONE DIA.	V. C. DIA.				
SP2A	9 1/4"	1"	ZC10161			
B	5"		ZC5093			

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.150ADC	190Ω	4.3 Henries	95-1170	C-2309 ②	C-2994 ②	TR-4200②	② Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	ZENITH PART No.	MEISSNER PART No.	
L2	Ant. Coil	0Ω		S-17173		
L3	Mixer Plate	.2Ω		S-17104		
L4	Osc. Coil	0Ω		S-16265		
L5	Trap Coil	0Ω		S-16501		
L6	1st Video IF	.1Ω		S-16274		
L7	2nd Video IF	.1Ω	.1Ω	S-16275		
L8	3rd Video IF	.1Ω	.1Ω	S-16604		
L9	Fil. Choke	.1Ω		S-16984		
L10	4th Video IF	.1Ω	.1Ω	S-16605		
L11	5th Video IF	.1Ω	.1Ω	S-17472		
L12	Peaking	9Ω		S-1704		
L13	Peaking	1.6Ω		S-15128		
L14	RF Choke	5.2Ω		S-17505		
L15	Peaking	18Ω		S-17053		
L16	4.5MC Trap	1.8Ω		S-17116		
L17	Peaking	8Ω		S-17052		
L18	Picture Control Coil	100Ω	.1Ω	S-17132		
L19	1st Sound IF	1.8Ω	1.8Ω	S-16855		
L20	RF Choke	8Ω		S-16011		
L21	2nd Sound IF	6.2Ω		S-16738		
L22	Quadrature Coil	4.7Ω		S-16013		
L23	Horiz. Osc.	145Ω		S-17114		Tap at 60Ω
L24	Horiz. Lin.	10Ω		S-17176		
L25	Width Coil	7.8Ω		S-17112		Tap at 1.2Ω

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					ZENITH PART No.		
M1	Bayonet	6-8	.15	Brown	100-67		Type #47

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M2	RF Tuner	S-17100	Includes RF shelf and turret.
M3A	Fuse		.175A 125V Type 3AG
B	Fuse	136-21	.25A 250V
M4A	Ion Trap	S-17164	12 and 19 inch picture tube
B	Ion Trap	S-17461	16 inch picture tube
M5	Focus Magnet	S-17230	
M6	Crystal	103-1	1N64 video det.
M7	Switch	85-488	Picture control
M8	Integrator	87-1	
	Escutcheon	57-1679	Channel selector
	Escutcheon	57-1678	Volume cont.
	Safety Glass	192-136	
	Knob	46-888	Channel selector, Models H2226R, H2227R, H2250R
	Knob	46-895	Fine tuning
	Knob	46-890	Volume cont., Models H2226R, H2227R, H2250R
	Knob	46-885	Contrast
	Knob	46-893	Brightness
	Knob	46-896	Vert. hold
	Knob	46-887	Horiz. hold
	Knob	46-889	Channel selector, Models H2227E, H2255E
	Knob	46-833	Volume contr., Models H2227E, H2255E